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San Francisco July, 1915

Mines and Mineral Resources

OF

Shasta County
Siskiyou County
Trinity County

CHAPTERS OF STATE MINERALOGIST'S REPORT
BIENNIAL PERIOD 1913-1914

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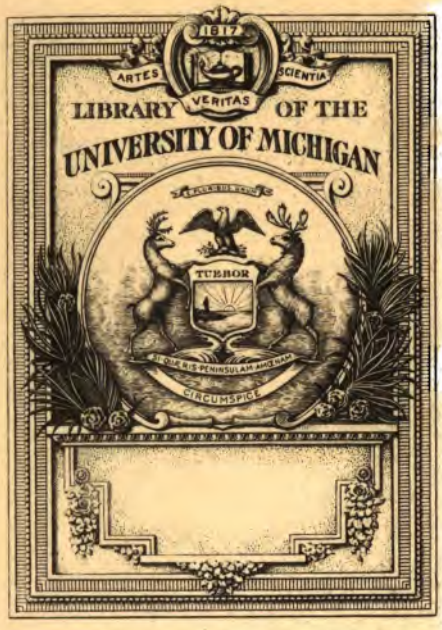
1915



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Mines and Mineral Resources

OF

Shasta County
Siskiyou County
Trinity County

COMPLIMENTS OF
F. McN. HAMILTON
STATE MINERALOGIST

By G. CHESTER BROWN, Field Assistant

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CONTENTS.

	Page
INTRODUCTION	1
Chapter I. Shasta County.	
Introduction	3
Water Resources	6
Timber Supply	6
Transportation Facilities	6
Table of Mineral Production	6
Mining Industries	7
Climatic Conditions	7
Mineral Resources	7
Hydroelectric Plants	8
Asbestos	8
Chrome	11
Clay Products	12
Coal	12
Copper	13
Description of Copper Belt	13
Outline of the Geology of the Copper Belt	14
Ore Deposits	15
Mines	16
Gold	29
History	30
Geology of Districts	31
Auriferous Gravel	32
Dredging	33
Mines—Quartz and Placer	33
Granite	60
Infusorial Earth	61
Iron Ore	61
Limestone	62
Macadam	63
Manganese	63
Marble	63
Mineral Springs	64
Sandstone	64
Tuff	64
Zinc	64
Bibliography	65
Chapter II. Siskiyou County.	
Introduction	66
Geological and Topographical Features	67
Description of Streams	67
Table of Mineral Production	70
Electrical Power Plants	72
Chrome	72
Clay Products	72
Coal	73
Copper	73

PAGE

GOLD ---- 76
DESCRIPTION OF MINING DISTRICTS ---- 77
MINES—QUARTZ ---- 81
MINES—PLACER ---- 99
MINES—HYDRAULIC ---- 100
MINES—GROUND SLUICING ---- 114
MINES—DRIFT ---- 116
DREDGING ---- 120
GRANITE ---- 121
IRON ---- 121
LIMESTONE ---- 121
MACADAM ---- 123
MARBLE ---- 123
MINERAL WATER ---- 124
ORNAMENTAL STONES ---- 125
PLATINUM ---- 125
QUICKSILVER ---- 126
SANDSTONE ---- 126
SOAPSTONE ---- 127
BIBLIOGRAPHY ---- 128

CHAPTER III. TRINITY COUNTY.

INTRODUCTION ---- 129
GEOLOGY ---- 130
HISTORY ---- 130
MINING CONDITIONS ---- 130
MINERAL RESOURCES ---- 131
ELECTRICAL POWER PLANTS ---- 132
ASBESTOS ---- 132
CHROMITE ---- 133
COAL ---- 133
COPPER ---- 134
GOLD ---- 138
MINING DISTRICTS ---- 138
MINES—QUARTZ ---- 140
PLACERS—HYDRAULIC ---- 157
PLACERS—GROUND SLUICING ---- 172
PLACERS—DRIFT ---- 173
DREDGING ---- 174
GRANITE ---- 175
IRON ---- 176
LIMESTONE ---- 176
MARBLE ---- 177
MINERAL PAINT ---- 177
MINERAL WATER ---- 177
ORNAMENTAL STONES ---- 178
PLATINUM ---- 178
QUICKSILVER ---- 179
SOAPSTONE ---- 180
BIBLIOGRAPHY ---- 181

INDEX ---- 183

ILLUSTRATIONS.

	PAGE
Lassen Peak, eruption of June 14, 1914, at 9:45 A. M.	4
Lassen Peak, new crater, 400 feet long, June 28, 1914	5
Stock & Stevens asbestos quarry, croppings	9
Stock & Stevens asbestos quarry, chrysotile deposit	10
Smelter, Afterthought mine	16
Mammoth smelter, bag house in center	24
Section of Gladstone mine	43
Stope map of Uncle Sam mine	57
Plan of workings, Uncle Sam mine	57
Holt & Gregg lime plant, Kennett	63
Klamath River near Happy Camp	68
Scott Bar	79
Davis hydraulic mine, Happy Camp	103
Dam of Forks of Salmon Mining Company	105
Marble Mountain, Siskiyou County	122
Island Mountain Consolidated copper mine	136
Globe mine, twenty-stamp mill	146
Globe mine, section of flume	147
Section of Headlight mine, Trinity County	149
Trinity Bonanza King mine; interior of mill	155
Trinity Bonanza King mine; automatic tram	155
Dredge of Alta Bert Dredging Company	175

INTRODUCTION.

The three counties presented herewith are situated at the extreme north end of the State, and midway between the eastern and western boundary counties. They thus include the upper end of the Sacramento Valley, with its northernmost tributaries, also portions of both the Sierra Nevada Mountains on the east and the Coast Ranges on the west, the two systems forming a junction at Mount Shasta in Siskiyou County. Lassen Peak which has recently been attracting attention by its renewed volcanic eruptions is in southeastern Shasta County.

The drainage systems of western Siskiyou and Trinity counties are tributary to the Klamath and Trinity rivers which flow direct to the Pacific Ocean. This western drainage area is the only district in California where hydraulic mining is still active on any considerable scale, because of the silt question not affecting any navigable streams.

Though the central part of this section of the State is traversed north and south by a transcontinental railroad line, the greatest drawback to the development of the three counties in question is lack of transportation facilities. This is particularly true of the distinctly mineral areas, in the rugged, western mountains. In addition to the mineral output, lumbering and stock raising are important industries.

Acknowledgment is here made of assistance rendered by the various owners and operatives of properties, both during the field work and in the subsequent preparation of this report.

SHASTA COUNTY.

Field Work in November, 1913.

INTRODUCTION.

Shasta County, noted since 1896 for its copper resources, has an area of 4050 square miles, and lies in the mountainous regions at the head of the Sacramento Valley. It is bounded on the north by Siskiyou, on the east by Lassen, on the south by Plumas and Tehama, and on the west by Trinity County, and derived its name from Mount Shasta, which, when the county was organized, stood within its limits. In 1852, when Siskiyou County was created, it was made to take in that portion of Shasta which contained this mountain, thereby depriving the county's name of its significance and fitness.

The western border of the county is along the Trinity Range summit, and the county reaches eastward high up the slope of the Sierra Nevada Range, which bears westward and merges with the Coast Range in Shasta and Siskiyou counties. Short irregular ranges cover the greater part of the county between the main ranges to the east and west.

In the southeastern corner is Lassen Peak, an old volcanic cone, which has exhibited true volcanic activity since May 30, 1914. In the bowl of the much eroded old crater a series of steam explosions have opened a new vent, and from it stones have been thrown over an area more than one half mile in diameter, and ejected volcanic ash has been wind-borne in sufficient quantities to make a perceptible deposit at a distance of fifteen to twenty miles. No freshly molten lava has been seen and no heat has been noticeable except that of escaping steam. Sulphur fumes and slight sulphur deposits near the vent have been noticed by nearly all observers. On June 28, 1914, the new crater was estimated to have a length of 400 feet. (See photos No. 1 and No. 2.)

"A heavy eruption took place on June 14th, and two new craters opened up a mile from the main hole. A shower of ash and stones fell from the craters and the smoke rose to a height of 5000 feet." (Report of J. M. Stark, United States Forest Service Lookout on Mount Turner.)

That volcanic activity is not yet extinct in the Lassen Peak district is shown by the presence of numerous solfataras and hot springs. At Bumpass' Hell, near the southern base of the peak, there are boiling mud pools and occurrences of vigorous solfataric action. Near by, at the head of Mill Creek, the sulphur deposited by such action is so abundant that attempts have been made to mine it.

Photo No. 1. Lassen Peak, eruption June 14, 1914, at 9:45 a.m.

Photo No. 2. Lassen Peak, new crater, 400 feet long, June 28, 1914.

Lassen Peak has four distinct summits, the highest having an elevation of 10,527 feet. During a period of activity a few hundred years ago the lava from this mountain blanketed the eastern portion of Shasta County as far as the Sacramento River.*

Water Resources. Shasta County has a splendid water supply. The rainfall, occurring chiefly in the winter, exceeds forty inches as a rule, and the snows of the higher ranges maintain the streams throughout the summer months.

The Sacramento, McCloud and Pitt, the principal rivers, afford valuable power resources. The first two of these rise in the mountains above the northern boundary, while the last has its source in Modoc County. The Sacramento flows southward through the western half of the county in a deep, sinuous and picturesque canyon, crossing the copper belt near the apex of the Sacramento Valley plain. The torrential Pitt crosses the axis of the Sierra Range through heavy forests and deep canyons and joins the Sacramento in the midst of the copper belt. The McCloud discharges into the Pitt amid the gossan cappings of the copper deposits. Thus there is a general convergence of the important rivers and streams of the county in and through the chief mineral region.

Timber Supply. The timber supply of Shasta County in the higher ranges is excellent, but in other sections adjacent to the mining districts, the supply is generally limited, although on some of the higher ridges yellow pine is found in considerable abundance.

Transportation Facilities. The California and Oregon branch of the Southern Pacific railway system crosses the county and affords direct transportation facilities for the copper belt along the course of the Sacramento River.

The Mountain Copper Company operates a narrow gauge railroad between the mine and Keswick Station. This road is eleven miles long and extremely tortuous in its course, descending a grade of nearly 2000 feet between the mine and its terminus.

The Sacramento and Eastern, a standard gauge railroad owned by the General Electric Company, connects the Bully Hill Mine with Pitt station on the Oregon branch of the Southern Pacific Railroad. This road is about fourteen miles long.

The Delta Consolidated railroad, owned by the Delta Consolidated Mining Company, connects Delta, a station on the Oregon branch of the Southern Pacific Railroad, with the mine. This narrow gauge road is seven miles long.

*Bibl.: Lassen Peak Folio, U. S. Geol. Surv., 1894; University of California, publications in Geography, August 7, 1914; Mining and Scientific Press, Vol. 109, p. 143.

Good wagon roads serve the outlying territory from the Southern Pacific Railway.

Mining Industries. Shasta County is identified with the State's early mining activity, this industry, however, being practically confined to the western third of the county, for the eastern half is buried, as a rule, under lava deposits, which effectually hide the minerals that undoubtedly exist.

In that portion of the county west of the Sacramento River, the early placers were rich and extensive, and recent and ancient auriferous gravel deposits remain, affording opportunities for various forms of placer mining, including gold dredging, which is being pursued near Redding.

Hydraulic mining operations are very limited, due to the State débris law, as Shasta is one of the counties affected by this act.

Quartz mining was of slow development, owing to the base character of the ores in most of the districts in which gold-bearing veins were early discovered.

Copper mining has received a setback due to the fume agitations and lawsuits resulting therefrom, yet a solution of this problem is looked for in the near future, as experimental plants are now being erected which should eliminate the trouble. The Mammoth was the only smelter in operation in Shasta County in 1913.

The smelting of iron ore with hydroelectric energy, as practiced at Heroult on the Pitt, is focusing the interest of the industrial world. The work has been done on a large and practical scale and results are of a definite nature.

Climatic Conditions. Shasta County has a wide range of climatic conditions, due to the difference in altitude from the valley floor, approximately 500 feet above sea level, to over 10,000 feet. Agriculture is pursued in the valleys and foothills, and a diversity of soil products grown.

Mineral Resources. Its mineral resources consist of gold, silver, copper, zinc, iron, chrome, barite, asbestos, coal, limestone, cement materials, clays, marble, granite, and mineral waters.

Shasta County in 1913 was first in the production of copper, silver and pyrite, third in lead, and sixth in gold. This county ranked fourth in the total mineral production of the State, but exclusive of petroleum, leads all others.

HYDROELECTRIC PLANTS.

The Northern California Power Company Consolidated, organized in 1900, is one of the large power distributing concerns of California. This company has seven generating stations, all in Shasta County, connected with its distributing system, as follows:

	Station capacity, h.p.
Coleman	20,000
Volta	8,500
Kilarc	8,000
Inskip	8,000
South Power House	6,500
South Cow Creek	2,000
Snow Creek	1,600
Total	54,600

The water resources of the Battle Creek drainage, in the main, supply its present requirements. The transmission system is modern in every respect, and some 970 miles of line distribute power throughout Shasta, Tehama, Glenn, and into portions of Trinity, Butte and Colusa counties. A reservoir is being constructed at the head of Burney Creek with a capacity of 30,000 acre feet.

ASBESTOS.

The holdings of Stock & Stevens are being developed in a systematic manner and considerable asbestos of a commercial grade is blocked out. This group, consisting of 1100 acres, is situated in Secs. 1, 2, 3, 4, 33, and 34, T. 37 and 38 N., R. 5 W., in the Trinity Forest Reserve, and about 3 miles east of Sims Station. The elevation varies from 3500 to 6300 feet. Mears Creek runs through the property. The croppings have been opened up in places for a distance of 13,500 feet (see photos Nos. 3 and 4). The country rock is principally serpentine, through which numerous dikes of diorite and gneiss have been thrust. This serpentine carries chrysotile asbestos, both slip and cross fiber, hornblende amianthus (Italian floss), amphibole, and mass fiber of all kinds. One deposit of chrysotile is 270 feet long, 100 feet high, and probably over 400 feet wide on the surface. There are four chrysotile quarries, the cropping faces being 100′ to 500′ in height, with no overburden. One ridge, 7000 feet long, a continuous chrysotile zone, can be worked by means of a steam shovel, from both sides. The average elevation of this ridge is about 6200 feet. A report on this asbestos deposit has been made by H. Leslie Parker (April, 1913). Mr. Parker states that "on these claims is a wonderful development of actinolite, occurring in the cross fiber fissures, some of which are five inches or ore in width and then decreasing in size to ribbon-like seams. The

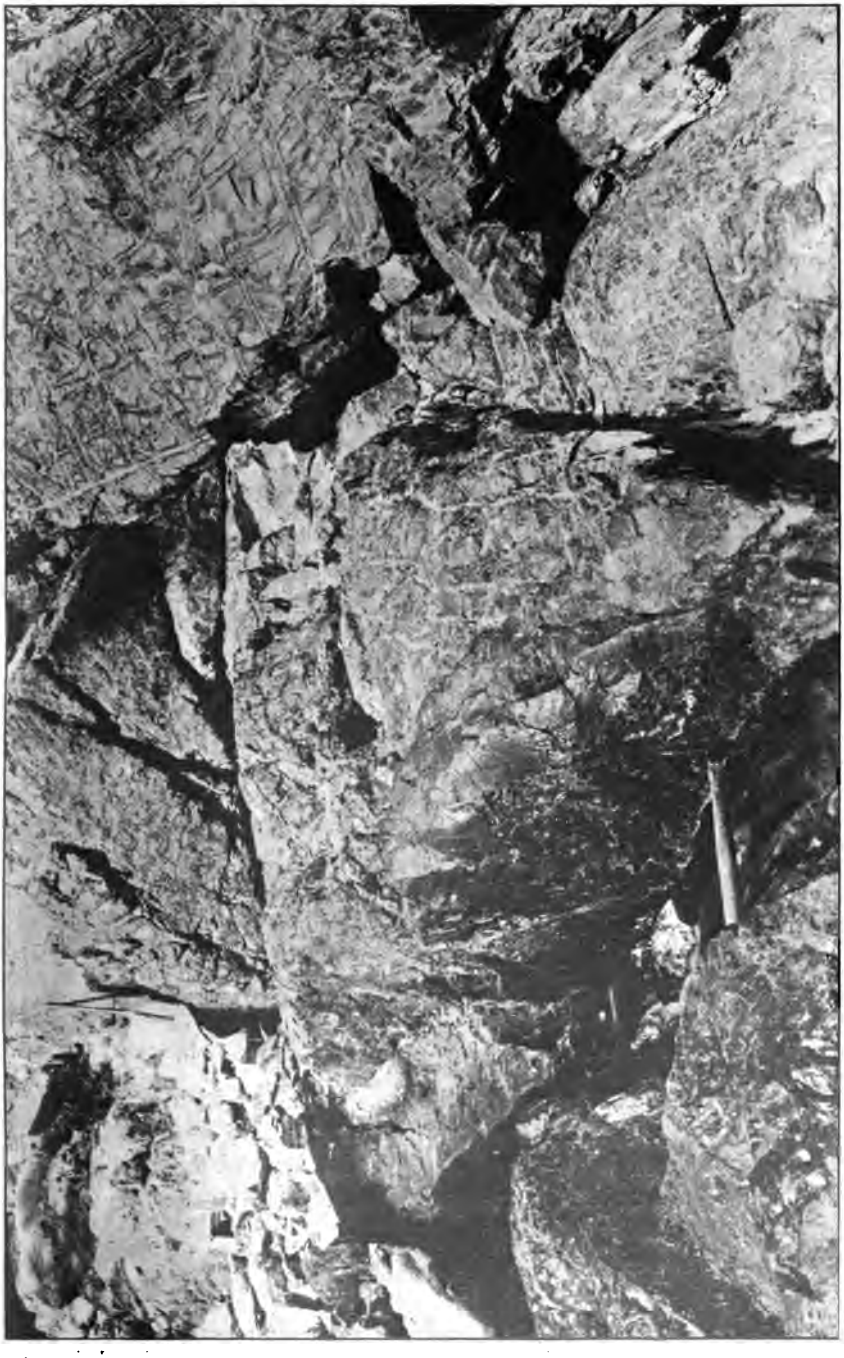


Photo No. 3. Stock & Stevens' asbestos quarry, croppings of chrysotile.

structure of this actinolite is similar to that of cross fiber chrysotile. In the creek bottom is shown cross fiber chrysotile of superior quality and is associated with slip fiber chrysotile, which occurs on the slickensided fractures caused by the rock movements. The claims on the whole are covered with a growth of excellent yellow pine, suitable for all mining, milling and tramway purposes. Hydroelectric power can be cheaply developed on Mears Creek, sufficient for very extensive mining and milling operations."

Investigations made to determine the quality of this asbestos by the Eaton-Philbrick laboratories show "that it is of the best quality, and

Photo No. 4. Stock & Stevens' asbestos quarry, chrysotile deposit.

that it is well adapted to any of the many uses to which asbestos has been put. The amphibole especially is recommended as a filter material, as it is easily worked up to the desired degree of fineness, gives a good yield of the finished product, and makes a firm close felt. The chrysotile fiber is of good tensile strength and very flexible. It also makes good filter material if extra long fiber is desired.

"Sample marked, Amphibole-White fibrous. Fire test: Fibrous material submitted to heat of furnace up to 2500 degrees F. showed no signs of fusion. Acid test: Prolonged action of hydrochloric and sulphuric acids had no appreciable effect on this material.

"Sample marked, Slip Material. Fire Test: This material was shredded and put into the furnace and heated to 2500 degrees F. No signs of fusion were observed even on the finer fragments. The original material being very brittle in itself it can not be said that this heating had any effect at all."

An excellent exhibit of asbestos from the Stock & Stevens quarry is on display in the State Mining Bureau's museum, San Francisco.

Anaconda, asbestos deposit consisting of 120 acres, is located in Sec. 6, T. 37 N., R. 4 W., about 4 miles north of Sims Station. It is owned by the Pacific Coast Asbestos Company, A. Boldeman, president; office, Oakland. There are seven small veins on the claims, having an average width of 2 feet. Strike is north and south, dip 50° E. The asbestos occurs between a slate hanging-wall and a granite footwall. Development work consists of several open cuts. Idle.

D. E. Miles, 1515 Lafayette street, Alameda, reports asbestos on his land in Sec. 36, T. 38 N., R. 5 W., about 5 miles northwest of Sims Station. No development work has been done to prove the extent of the deposit.

CHROME.

Prim & Dougherty own three chromite claims in Secs. 13 and 24, T. 37 N., R. 5 W., near Sims Station. This chrome belt has been opened up for a length of over 1000 feet. The ore is lustrous black, carrying a high percentage of chromic oxide; it lies in serpentine, in lenticular form. The workings consist of short tunnels, and a 30-foot shaft with 8 feet of ore on the bottom. About 1500 tons of ore extracted from the original discovery on the north of Shotgun Creek. The chromite is shipped to Colorado, Montana and Arizona, and has been used for furnace bottoms at the Bully Hill and Keswick copper smelters. Prim & Dougherty own another claim in Sec. 22, T. 37 N., R. 5 W., on which very little development work has been done and from which no ore has been shipped.

Bibl.: Bull. No. 38, pp. 270, 271, 362.

Little Castle Creek in Sec. 2, T. 38 N., R. 4 W., near the boundary line between Shasta and Siskiyou counties. Owner, L. H. Brown, of Dunsmuir. Holdings consist of 80 acres, located in 1906. Deposit worked by open cuts. Equipment consists of a short tramway and dwelling. Production to end of 1913, about 2400 tons. Four men employed.

Holden et al. of Lamoine own eight claims in Sec. 22, T. 37 N., R. 5 W. Only a small amount of development done, so prospective value can not be determined.

CLAY PRODUCTS.

The Sacramento River Valley bottom, below the mountains, contains extensive clay banks, and on the higher table lands debris accumulation has in places formed clay deposits.

Alata Lime and Brick Company, formerly known as Coleman & Hill, owns the clay bank in Block 29, Redding Grant, about 1¼ miles south of Redding, in the Sacramento River bottom. The clay is 6 feet thick, the upper 4 feet being plastic, which grades into and rests upon a bed of sand, underlaid in turn by gravel; color is tawny. In former years a great many bricks of good quality were burned in this yard.

Bibl.: Bull. No. 38, p. 256.

Holt & Gregg of Redding own a clay deposit in Sec. 17, T. 30 N., R. 4 W., in the town of Anderson. The holdings consist of 200 acres, patented. Another deposit owned by this firm is 2 miles north of Anderson, near the railroad. This clay bed is 15 feet thick and worked by means of open cuts. Equipment for making bricks consists of grinding mill, brick kiln of a capacity of 40,000 bricks in seven hours, cars, etc. The stack is 120 feet high, with 12 feet diameter at base and 8 feet at the top. Cost about $4.50 per thousand to manufacture the brick, which are used for buildings in Redding and other towns in the Sacramento Valley. Fifteen men employed at present. Plant operated upon demand.

This firm also owns a good deposit of fire clay in Sec. 34, T. 34 N., R. 5 W. Used in limekilns for lining.

Bibl.: Bull. No. 38, p. 257.

R. L. Reading owns an extensive clay deposit in the Reading Homestead, east of Cottonwood. This deposit, on the Sacramento River, is 1 mile long and ¼ of a mile wide. The clay is 30 feet thick, capped by 15 feet of gravel. It has not been developed.

Southern Pacific Railway Company owns a clay bed in Sec. 19, T. 32 N., R. 4 W. This deposit covers about 40 acres, and is topped with gravel. It is undeveloped.

Redding Brick and Tile Company owns 40 acres, patented, in Sec. 19, T. 31 N., R. 5 W., 3 miles southwest of Redding. Small kiln at Redding. Idle. Operated upon demand.

Bibl.: Bull. No. 38, p. 257.

COAL.

A bed of coal in Sec. 20, T. 33 N., R. 1 W., M. D. M., has been prospected to a limited extent by M. Kincaid, but the quality is poor, due to the presence of slate. The total thickness of this bed is 15 feet and is often traversed by sheets of slate and clay. It is of late origin geologi-

cally speaking, and the dip is practically horizontal. It would not pay to work. Coal croppings are found in other localities near this section, especially on Secs. 3, 7, 8, and 21, T. 33 N., R. 1 W., and also on Sec. 12, T. 33 N., R. 2 W. Very little work has been done and no coal has yet been found that could be mined at a profit.

Bibl.: Reports VII, pp. 190, 191; XI, p. 29.

A body of coal-bearing strata of recent origin is noted in the eastern part of Shasta County, among the western foothills of the Sierra Nevadas, about T. 37 N., R. 1 E., M. D. M. This deposit, covering several townships, consists of strata of soft and unaltered shales and sandstones, having a thickness of about 150 feet, and are spread out unconformably over the upturned edges of the metamorphic gold-bearing slates which form so large a part of the mass of the Sierras.

COPPER.

Description of copper belt. (Extract from Bulletin No. 50.) The crescent-shaped copper belt of Shasta County has a length of approximately 30 miles, and a width of from ½ to 4 miles. The city of Redding, near its western end, is a little south of the chord of the arc described by the belt, while Iron Mountain and the Furnaceville district are the western and eastern ends, respectively, of the horn. The ore deposits occur as disconnected masses, or groups of vein formations, forming individual lodes and districts, and not as a continuous fissure system. These groups of deposits vary both in form of occurrence and in mineralization, being massive, lenticular beds of sulphides on the west, while the eastern half of the belt consists of irregular vein systems, the entire length being marked by massive exposures of gossan which cap its mineralized formations. These croppings of iron oxide and sulphide stand out boldly on the elevations, especially on Iron Mountain, the westerly end of the copper belt. Southerly from Iron Mountain only two or three known copper deposits occur, widely separated, the mineral formations of the belt being succeeded through the adjacent regions by gold quartz veins.

The belt intersects the Sacramento River in Sec. 36, T. 34 N., R. 5 W., M. D. M., at the point where it receives the Pitt, and for 10 miles eastward it exhibits its gossan croppings on both sides of the latter stream, being bolder, however, on the north side. The McCloud River empties into the Pitt about 4 miles east of the Sacramento, thus terminating in the midst of the copper belt. The Pitt enters the belt farther eastward, and many of the tributaries to this stream and the Sacramento cross it; numerous gulches diminish its apparent continuity, the gossans here and there having been eroded away or covered by surface wash.

The ores all carry gold and silver, with a low percentage of the baser metals, zinc, antimony, lead, etc.; the values as a rule are higher in the central and eastern districts of the belt than in the larger ore bodies developed to the west. Many of the important copper properties were originally worked for their gold and silver values remaining in the decomposed portions of the deposits near the surface above the copper sulphides which are now being developed.

Fluxing materials are plentiful and easily accessible, due to the quartz districts adjacent to and the large lime deposits in and near the copper belt.

An ample supply of wood and timber, abundance of water, suitable smelter sites, transportation facilities, and good climatic conditions, present many favorable features for copper mining and smelting.

The Mountain Copper, Mammoth, Bully Hill, Balaklala and Afterthought are the noted copper mines. Smelters have been erected and operated by these companies, but only one, the Mammoth, was in operation in 1913. The Mountain Copper plant has been dismantled and the ore is now shipped to their smelter near Martinez.

Outline of the Geology of the Copper Belt. (Extract from Bulletin No. 50.) The oldest sedimentary rocks are those of the Devonian age, which are found especially along the western districts extending northward from Clear Creek to the Big Backbone, and also east of the Sacramento River, in the vicinity of Baird. These rocks are metamorphic and include the limestones and their underlying slates, or schists, found near Kennett, Copley and Horsetown.

The Carboniferous represents the next succeeding period among the sedimentary rocks, and includes both limestones and slates. This period is represented by the conspicuous limestone belt east of the McCloud River, near Baird, and extending in a southerly direction beyond the Pitt River.

The next oldest sedimentary rocks, succeeding the Carboniferous period, is represented by those of the Triassic age, which occur still farther east in the vicinity of Squaw Creek and Bear Mountain. They consist, for the most part, of silicious slates, overlain in some places by limestone which is usually very fossiliferous. The limestones to the north and east of Bully Hill belong to the Triassic period.

The igneous rocks are vitally connected with the ore deposits of the copper belt. The geological age to which they seem referable can not be younger than the Cretaceous nor older than the Triassic. Most of the rocks are of acid character, being high in the percentage of silica. In the main, igneous rocks seem to underlie all of the sedimentary rocks. Rhyolite, trachyte and andesite are names properly given to surface flows of volcanic rocks, and such flows occur throughout the copper districts, associated with tuffs and breccias of a similar age and charac-

ter. These volcanic rocks, including both the flows and the fragmental rocks, are especially seen near Iron Mountain, the Shasta King, Bully Hill and Afterthought mines. Porphyry and diabase dikes occur in the belt also, the latter accompanying the iron ores. The copper belt, in the main structural features, consists of a number of north and south folds, or belts, of sedimentary rocks which belong to a succession of periods, and beneath which extend the rocks of the great granitic intrusions. Dike rocks have been found penetrating both the eruptives and the overlying sedimentary rocks.

ORE DEPOSITS.

The deposits of copper belonging to the Shasta belt are vastly different from the usual quartz veins as ordinarily understood, both as to their forms as ore bodies and as to their origin. These ore bodies, as a rule, are of great size, consisting of large bodies of massive sulphides occurring along the borders of or within areas of eruptive rocks. They are not often bounded along the sides by definite walls, though sometimes one wall is in evidence, emphasized as to its extent by a selvage of clay and other similar material showing a certain amount of either lateral or vertical movement. Evidence is lacking to show that such walls have had any connection with the genesis of the ore. The ore bodies fade out by gradual transitions from ore, in which there is more or less waste, to rock in which there is more or less ore, and finally into rock with only a small percentage of disseminated sulphides.

There are three classes of ore deposits within the copper belt. The first of these consists of deposits of magnetic iron (magnetite) with pyrrhotite and pyrite, as represented north of the Pitt River, and southeast of Baird, and the largest at the head of Potter Creek. The second class consists of massive deposits of pyrite, chalcopyrite and other sulphides, which form the principal deposits of copper ore lying west of the Sacramento River, and includes the ore bodies of Iron Mountain, Squaw Creek, Backbone Creek, etc. The third class, including vein-like deposits of mixed sulphides, and a relatively large percentage of gold, silver, zinc, antimony, etc., is represented by the ore bodies of Copper City, the Bully Hill, Afterthought, and other mines.

Residual accumulations of metallic oxides often form thin crusts of masses of "gossan," or else only stain the rocks upon which it is deposited. The chief metallic element of the "gossan" is iron, though it very often contains a small percentage of copper, and it has often formed an ore of gold and silver, as in the Iron Mountain, Bully Hill and Afterthought mines.

The "gossan" at the Iron Mountain consists in many cases of crusts of limonite many feet in thickness, while at the Bully Hill the surface indications are very different, although the term "gossan" is likewise

applied. Instead of crusts of limonite the surface at the latter is largely covered by broken and stained masses of rock, often light colored, but generally containing some metallic oxides.

COPPER MINES.

Afterthought, formerly known as the Peck, is located in the North Cow Creek mining district, in Secs. 10, 11, 15 and 5, T. 33 N., R. 2 W., M. D. M., in the Shasta Forest Reserve, and in the town of Ingot, which is 24 miles from Redding, the county seat. This group, consisting of 1650 acres, of which 1550 are patented, is owned by the Afterthought Copper Company, formerly known as the Great Western Development Company, S. E. Bretherton, president and manager; T. H.

Photo No. 5. Smelter, Afterthought Copper Mine.

Adams, secretary; J. H. Bull, superintendent; F. L. Wilson, chemist. Home office, Indianapolis, Ind. The Copper Hill and the Afterthought claims hold the larger part of the ore body and are the main producers. The ore body is distinctly a contact deposit in a formation of marked schistose character, which is indicatory of severe metamorphic action, the richest ore being encountered where the greatest movement has taken place in the shales and stratified andesite. The contact is followed to a considerable depth, much of the best ore being mined from the lower levels.

There are two parallel veins, the Afterthought and Copper Hill, having a northwest and southeast strike, and a dip of 40° NE. Occurrence and shape of the ore resembles that of the Bully Hill. Workings consist of a main adit 2200 feet in length (nine tunnels in all), six levels, crosscuts, raises, stopes, 536-foot shaft and 230-foot winze, comprising in all several thousand feet of development work. Ore shoots have a

length of 400 and a width of 25 feet. The ore is extremely refractory, containing, besides gold, silver and copper, a high percentage of zinc (sphalerite) and barium. The average ore carries 2.81% copper, 11.6% iron, 5.4% lime, 3% zinc, 20.25% sulphur, 18% silica, 5.3% alumina, 7.4% barite, and $4 per ton in gold and silver. Laboratory experiments are being made to endeavor to devise a method of working the high grade zinc ores.

The mine equipment consists of a 30-inch gauge railroad, 1 mile long from the mine to the smelter, Davenport steam locomotives, two 20 h.p. steam and one 30 h.p. electrical hoists, cages, air compressor, drills and all necessary buildings. The smelter plant, 1 mile below the mine in the town of Ingot, 150 tons daily capacity, was constructed in 1904 and operated until 1908, during which time the output averaged $350,000 yearly (see Photo No. 5). This plant consists of two blast furnaces, two hot blast stoves, blowers, pumps, sampling mill, crushers, storage bins, ore yards, shops, dwellings and offices, and one electrical substation, power being obtained from the Northern California Power Company. Company also owns the railroad from Anderson to Bella Vista (old Shasta Lumber Company's road), and supplies are hauled from Bella Vista to the plant, a distance of 12 miles. The cost of operating the smelter is heavy, so that only a high grade of ore can be handled. This property is on the eastern end of the copper belt, and was discovered in 1872 by James Peck, and after passing through several hands was acquired by the present owners in 1903. Worked at one time for gold only, as some of the oxide ore on the surface was very rich. Company claims a considerable tonnage of good ore in sight. During 1913 only five men were employed. Donkey mine adjoins this group on the east.

Bibl.: Bull. No. 50, pp. 102-105.

Arps, in Secs. 20, 21, 28 and 29, T. 34 N., R. 3 W., 1¼ miles north of Copper City, in the Pittsburgh mining district, consists of 250 acres in the Shasta Forest Reserve, adjoining the Copper City claims of the Bully Hill Mining Company. Owners are Arps & Saeltzer. Development work consists of five tunnels, from 350 to 850 feet long, and a 160-foot drift. Ore is base, carrying considerable zinc. Formation similar to the Bully Hill. Some good ore found on the surface. Arps, one of the owners, doing some development work. Prospect.

Bibl.: Bull. No. 50, p. 110.

Balaklala Copper Mine, consisting of 1149 acres, patented, is in the Flat Creek mining district, in Secs. 10, 11, 12, 13, 14, 17, 20 and 21, T. 33 N., R. 6 W., about 3 miles northwest of Coram Station. It is owned by the First National Copper Company, but is operated under

the name of the Balaklala Consolidated Copper Company, T. W. Lawson, president; W. A. Kerr, secretary; F. M. Leland, general manager; D. S. Epperly, superintendent. Home office, New York. Property acquired in 1905 from the Western Exploration Company. The mines are located on the south side of Squaw Creek at an elevation of 2400 feet. The country rock is meta-rhyolite; several faults from 2 to 100 feet in width parallel with the strike of the ore bodies. Ore bodies consist of a hard, heavy iron sulphide, carrying chalcopyrite, a little galena, covellite and some gold and silver. Two large separate ore bodies are known, one near Mule Gulch, the other in the vicinity of Windy Camp. The eastern body, near Mule Gulch, was discovered by means of diamond drills and developed through the Weil tunnel, which has a length of 2400 feet. Raises were made through its entire thickness, and drifts run on both sides through the ore and the dimensions were found to be 1200 feet in length (east to west), 300 feet in width (north and south), and from 20 to 40 feet thick. The development work comprises several thousand feet of drifts, three crosscuts from 40 to 400 feet in length, eight levels, eight raises from 40 to 400 feet in height, tunnels and open cuts. Ore is blocked out in 25-foot sections from the Weil tunnel. The other deposit, Mule Gulch, is over 900 feet long and 20 to 60 feet thick. Ore is reported to run: gold .025 oz.; silver .85 oz.; copper 2.46%; silica 23.5%; iron 29.8%. Equipment consists of 16,500 feet of aerial tramway to bring ore from mine to smelter, 3 miles of telephone line, and all equipment necessary to operate a large mine. The smelter plant, some 3 miles from the workings, at Coram, consists of four 18-foot McDougal roasting furnaces, three 55″ x 240″ water jacketed blast furnaces, smelting furnaces, one 17′ x 92′ reverberatory furnace, water plant, sampling mills, three boilers using oil for fuel, generators, offices, etc. Electric power obtained from Northern California Power Company. Daily capacity of smelter 1000 tons; production in 1908 was 3,061 tons. Smelter idle since 1911. Number of men employed at present sixty-five—fifteen in mine and fifty on surface. Total operating cost in 1908 was $5.58 per ton. One of the large copper mines of Shasta County, with over 2,000,000 tons of ore in sight. Hall desulphurizing plant being installed.

Bibl.: Bull. No. 50, pp. 88–94; Reports X, p. 638; XII, p. 245; XIII, p. 61.

Bald Eagle, consisting of 140 acres, in Sec. 10, T. 34 N., R. 3 W., 2 miles north of De La Mar, in the Pittsburg mining district. Claims are in the Shasta Forest Reserve. Owner, J. Gilardy. Ore similar to the Bully Hill. Only small amount of development work done and extent of ·re body not determined. Idle at present.

Brushy Canyon, consisting of 160 acres in Sec. 34, T. 34 N., R. 3 W., about 2 miles southeast of Copper City, in the Pittsburgh mining district. Owners, W. Collins et al. A tunnel is in over 300 feet through a black, slaty-shale formation, distorted and sheared by intrusions. Ledge outcrops on the surface. Idle.

Bibl.: Bull. No. 50, p. 102.

Bully Hill, one of the famous copper mines of California, is located in Secs. 15, 16, 21, 22 and 28, T. 34 N., R. 3 W., M. D. M., in the Pittsburgh mining district, near the town of De La Mar, and in the Shasta Forest Reserve. The holdings comprise 450 acres, of which 320 are patented, and include the old Winthrop and Baxter, Bully Hill, Rising Sun and Rising Star groups, all well toward the eastern end of the copper belt. General Electric Company, of Syracuse, New York, owners. Geo. Hanley, superintendent. The Sacramento and Eastern standard gauge railroad, owned by this company, connects the mine with Pitt station on the Oregon branch of the Southern Pacific Railroad. This road is about 14 miles long, and handles all necessary freight. The Bully Hill mine lies in meta-rhyolite. The ore is found in veins trending northeast and southwest with almost a vertical dip to the east, width from 4′ to 400′, averaging about 30′. The eastern wall is formed by basalt, and the vein occupies a shear zone. Two main parallel lodes have been exploited. The ore occurs in irregular lenticular bodies, connected by narrow seams of ore, attaining an average width of 45 feet, and a length of 200 feet. In the basalt wall are found ore deposits fully equal to those occurring in the vein. The ore is of a complex and refractory nature, carrying zinc, antimony, copper, gold and silver. Copper oxides are found in the upper levels, changing into copper glance (chalcocite) with depth, and chalcopyrite in the lowest levels.

The mine has been opened by a number of tunnels with extensive drifts, crosscuts, raises, comprising several thousand feet. There are nine levels 100 feet apart, eight raises from 50 to 560 feet in height, and 1100-foot crosscut on the Bully Hill claim. The lowest tunnel (No. 3 level) was run as a crosscut and struck the vein at a distance of 1100 feet, and about 600 feet below the gossan outcrop. At this point a station (100 feet square) was established, extensive hoisting and pumping machinery installed, and a 3-compartment shaft sunk to a depth of 950 feet. No. 3 level is connected by chutes and raises with the upper workings, of which some drifts run along the vein 800 and 1000 feet. This level is connected by railway with the smelter 1 mile distant and the ore handled through it. The mine is timbered by the square set system, the timbers being floated down the Pitt River from the timber region to the northeast.

The mine equipment consists of cars, tools, a 2-drum electric hoist, two electrical pumps, shops, compressor plant, and all necessary dwellings.

The smelting plant, daily capacity 400 tons, was installed in 1901, at a cost of $200,000, and consists of one water-jacket furnace (42" x 120"), two calcining furnaces, five converters for bessemerizing the matte, shops, etc. Idle during 1913. The product of the converters is blister copper about 98% fine, and is shipped to the refinery built by Capt. De La Mar on Kill von Kull, near New York City. As the ore carries considerable zinc, laboratory tests are being made to find a proper method of treatment. During 1913 sixteen men were employed. This mine has the greatest depth below the surface of any copper property in California, and has produced several millions. It was worked as a silver mine in the '60s by H. McDonnell, as the ore on the surface carried high values in this metal. Acquired later by James Sallee, and purchased by Captain De La Mar in 1899 and sold in 1903 to present owners.

Bibl.: Bull. No. 50, pp. 78–84; Report XIII, pp. 61, 62.

Chance, in Sec. 21, T. 34 N., R. 3 W., consists of 80 acres, patented, in the Pittsburgh mining district, about 1 mile north of Copper City. Owner, R. G. Dunn. Ore body, consisting of heavy grayish sulphides, is similar to the Bully Hill. Extent of shoot not determined, as only small amount of development work has been done. Short tunnels. Bully Hill group of claims to the east. Prospect. Idle.

Congress, consists of 120 acres in Sec. 4, T. 33 N., R. 2 W., in the North Cow Creek district, about 2 miles west of Ingot. Owner, H. A. Cook, of Ingot. A series of exploration tunnels aggregating 500 feet have been run, but no great depth below the croppings have been reached. Owner does assessment work only. Prospect

Bibl.: Bull. No. 50, p. 111.

Copley listed under gold.

Crystal Group, consisting of twenty-three claims, is located in Sec. 11, T. 33 N., R. 6 W., in the Flat Creek mining district, adjoining the Balaklala on the north and the Vulcan on the west, and about 3½ miles northwest of Coram. Owners, Crystal Copper Company, W. S. Tyler, president; J. L. McGinnis, secretary. Short tunnels. Idle. Prospect.

Bibl.: Bull. No. 50, p. 113.

De Dallis, consists of 175 acres in Sec. 34, T. 34 N., R. 3 W., in the Pittsburgh mining district, about 1½ miles southeast of Copper City, in the Shasta Reserve. Owners, Ellis et al. Slate foot and quartz-porphyry hanging-walls. Ore body said to be 200 feet long and 8

feet wide. Several hundred feet of development work consisting of 420-foot tunnel and drifts. Three men employed. Prospect.

Bibl.: Bull. No. 50, p. 102.

Donkey, consists of 40 acres, patented, in Sec. 11, T. 33 N., R. 2 W., in the North Cow Creek mining district, about 2 miles northeast of Ingot, and in the Shasta Forest Reserve. Owner, A. J. McKendrick, of Ingot. It is an old property located in 1876 by A. J. Cook, and said to be an extension of the Afterthought lead. The ore occurs in rhyolite, and is a heavy grayish sulphide, carrying a high percentage of zinc, in addition to copper, gold and silver. Development work consists of a 200-foot shaft, 300 feet of drifts, and a 100-foot raise. Equipment consists of electrical hoist, 1500-gallon electrical pump, and dwellings. Western Zinc Company of San Francisco worked the property on a lease for a time and shipped 300 tons of ore to their plant at South San Francisco. Ore very difficult to treat on account of zinc. Property has been a producer. Idle.

Bibl.: Bull. No. 50, pp. 105, 106.

Friday & Lowden, consists of thirteen claims, in Secs. 5 and 6, T. 33 N., R. 5 W., about 3 miles west of Kennett, in the Backbone mining district. Owner, J. R. Lowden et al., of Redding. This group of claims is the first encountered on the copper belt on the north side of Squaw Creek, and is directly east of the gold belt in which the Uncle Sam mine is located. Elevation about 2000 feet. The geological conditions are similar to those found in adjacent territory on the copper belt. Oxide ore carries considerable gold, and the property was worked at one time for this metal. Workings consist of about 1000 feet of tunnels. Idle.

Bibl.: Bull. No. 50, pp. 94, 95.

Giant Consolidated, consists of thirteen claims, in Secs. 19 and 24, T. 33 N., R. 5 and 6 W., about 3 miles northwest of Copley, in the Flat Creek mining district. Owners, W. H. Soderberg et al., of San Francisco. Claims are located on the eastern edge of this part of the copper belt, north of the Jumping Jack. Only slightly developed by a 310-foot tunnel, and some open cuts. Prospect. Idle.

Bibl.: Bull. No. 50, p. 85.

Gold Belt, consists of six claims, in Sec. 4, T. 33 N., R. 2 W., about 2 miles west of Ingot, in the North Cow Creek mining district, and in the Shasta Forest Reserve. Owners, Jones & Tucker, of Ingot. A 50-foot shaft penetrated 6 feet of iron capping, below which a schistose and slaty formation was encountered, carrying copper sulphurets with traces of gold, silver and zinc. Prospect. Idle.

Bibl.: Bull. No. 50, p. 111.

Golinsky Group, formerly known as Little Backbone, under bond to J. Bayhau, is located in Sec. 28, T. 34 N., R. 5 W., about 4 miles west of Kennett, in the Backbone mining district. Owner, B. Golinsky, of Kennett. Holdings consist of 300 acres, patented, adjoining the Mammoth mine on the east. Ore body and formation similar to the Mammoth. Workings consist of several tunnels, one being 800 feet in length, 400 feet of drifts, and one stope. Ore bin and dwellings on the property. Produced $70,000. Five men employed. Some good ore in sight.

Bibl.: Bull. No. 50, p. 111.

Great Verde, formerly known as the Vulcan, is located in Secs. 11 and 12, T. 33 N., R. 6 W., about 7½ miles west of Kennett, in the Flat Creek mining district. Holdings consist of twelve claims (four patented), owned by the Vulcan Mining Company of San Francisco. W. K. Lisle, superintendent. Several tunnels. Some low grade ore in sight. A little prospecting done with a diamond drill. Adjoins the Balaklala on the north. Idle at present. Prospect.

Bibl.: Bull. No. 50, p. 98.

Hartford consists of ten claims, 3 miles north of the mouth of Protem Creek. Owners, Hartford Consolidated Mining Company, W. Gerry, president. Limited amount of sulphide ore. Only developed to a limited extent by 500 feet of tunnels. Lode on the surface 8 feet wide, and can be traced about 100 feet. Surface ores consist of oxides and carbonates of copper. Prospect. Idle.

Bibl.: Bull. No. 50, p. 108.

Indiana and Last Chance consists of four claims, in Sec. 29, T. 33 N., R. 5 W., about ½ mile north of Copley, in the Flat Creek mining district. Owners, Roan & Putney. Workings comprise several hundred feet of tunnels and drifts. Heavy sulphide ore, with some high grade oxides on the surface. Small producer. Two men employed.

Ingersoll, formerly known as the Peerless, is located in Secs. 25 and 36, T. 33 N., R. 6 W., in the Flat Creek mining district, about 2 miles west of Copley. Holdings consist of 300 acres, adjoining the Trinity Copper Company's property. Heavy gossan outcrop similar to the Trinity Copper, on same lead. Workings consist of a 350-foot tunnel on the lode, and a 190-foot crosscut. Idle.

Bibl.: Bull. No. 50, p. 114.

Jumping Jack consists of five claims in Secs. 24 and 25, T. 33 N., R. 6 W., in the Flat Creek mining district, about 3 miles west of Copley. Owner, W. Candrick. Claims on same belt as the Iron Mountain. Only

slightly developed by a tunnel 400 feet long; extent of ore body not determined. Prospect. One man working.

Bibl.: Bull. No. 50, p. 85.

Kosh Creek, consists of twelve claims, in Sec. 23, T. 37 N., R. 1 W., several miles north of the copper belt. Owners, W. Murray et al. Ore is a dark basaltic rock, carrying native copper, which occurs in globules and films in the vesicles of the rock. Ore zone said to be 200 feet wide. Slightly developed. Idle. Prospect.

Bibl.: Bull. No. 50, p. 108; Report XIII, p. 63.

Loraine, located in Secs. 7 and 8, T. 33 N., R. 5 W., adjoins the Spread Eagle group on the northeast, and about 4 miles west of Coram Station. Owner, D. Endicott et al. One tunnel 425 feet long on the ore body and several short crosscuts. Idle.

Bibl.: Bull. No. 50, p. 87.

Mammoth Copper Mine, the largest copper producer in California, is located in Secs. 2, 3, 29, 31, 32, and 33, T. 33 and 34 N., R. 5 W., about 4 miles northwest of Kennett. The holdings, consisting of 2500 acres patented, and several claims held by location, are owned by the United States Mining and Smelting Company, but this mine is operated as the Mammoth Copper Mining Company. President, W. G. Sharp; secretary, F. W. Bachelder; general manager, F. W. Metcalf; superintendent of mine, R. E. Hanley; superintendent of smelter, J. H. Kerbin. Home office, Boston, Mass. Elevation at main workings 3000 feet. Formation and character of ore similar to other mines on the western portion of this copper belt. Some of the ore bodies are 800 feet long and 90 feet wide, and are opened up by numerous tunnels, drifts, stopes, etc., aggregating over 60,000 feet of development. The lowest tunnel, the Coleman level, is over 2200 feet long, and serves for hauling the ore from all parts of the workings to the surface, where it is dumped into bins, and then conveyed to the smelter, a distance of four miles, by means of electric cars. In working the mine the top-slicing method is used. After removing the ore from a certain area the empty stope is filled by caving down the roof. The effect of this method is seen on top of the mountain above the workings, where the ground has caved in many places and is crossed by numerous fissures.

The greatest depth on the ore bodies is 700 feet. There is a large tonnage of low grade ore blocked out. The mine equipment consists of all mechanical devices necessary to operate on a large scale, such as compressors, sawmill, shops, railways, both electric and steam (at smelter), ore bins, dwellings, etc. Nelson, the discoverer of this mine,

worked it in a small way for gold, as the gossan carries gold values similar to the Iron Mountain. The smelter at Kennett has a capacity of 2200 tons (see photo No. 6). A bag house has been installed to gather the fumes. The semi-pyritic process of smelting is used, the ore being treated with a low percentage of coke. The matte is treated and refined at Chrome, New Jersey. Smelter is not running at full capacity, as only 1200 tons are being handled at present. About 825 men are employed. Operating cost is very low. The smelting process consists in eliminating the excess of iron in the ore by adding an excess

Photo No. 6. Mammoth Smelter; bag house in center.

of silica and lime to the charge, so as to obtain a thin slag. It requires one car of coke to three of ore and silica, which are automatically conveyed from the weighing platform to the blast furnaces (five in number) by means of electrical trains. The matte from the furnaces is taken to the converters by means of a 50-ton crane. The converters, made by Allis-Chalmers Company, are 96″ x 150″ and are acid lined. When the five converters are running the first matte is reconcentrated in the blast furnace up to 40%. Matte as low as 18% has been treated.

The bag house, contained in a building 210′ long, 63′ wide and 66′ high, was built in 1910 to remove the arsenic, sulphur and other impurities from the fumes. This house is divided into five sections or towers, each section containing 592 bags, or a total of 2960. The bags, made of woolen, are 34 feet long and 18 inches in diameter, and are set longitudinally. The residue, collected in the bags from the fumes, is in the form of a white powder (arsenic, sulphur, gold), and when shaken from the bags drops into a water hopper and is then removed. As no process has as yet been devised for treating this residue, it is stored near the smelter. Some 16 tons obtained daily at the present time. Upon leaving the blast furnaces, these fumes pass through a steel pipe 10 feet in diameter, thence into brick flues, then into four

steel pipes, each 8 feet in diameter, thence into a fan discharge chamber from which they enter steel pipes 4 feet in diameter, arranged in nine sets of five each, and then into the distributing chamber of the bag house.

Bibl.: Bull. No. 50, pp. 95, 97.

Marshall & Walters, consists of 160 acres in Secs. 14 and 15, T. 33 N., R. 6 W., in the Flat Creek mining district, about 4 miles west of Coram Station. Owners, Marshall & Walters, of Redding. Slightly developed by a tunnel 400 feet long. Prospect adjoining the Stowell on the south. Idle.

McClure, consisting of 160 acres, patented, is located in Secs. 9 and 16, T. 34 N., R. 3 W., 1½ miles north of Copper City, in the Pittsburgh mining district, and adjoins the Bully Hill on the northeast. Owners, Mt. Shasta Gold Mines Corporation. Formation and ore body similar to its famous neighbor. The principal development work consists of a crosscut tunnel over 500 feet long, in which some good ore is exposed. Prospect. Two men employed.

Bibl.: Bull. No. 50, p. 110.

Mineral Mountain consists of six claims, on the southwest terminus of the copper belt, in Sec. 13, T. 32 N., R. 6 W., in the Flat Creek mining district, and 3 miles south of Iron Mountain. Owners, D. T. Callahan et al. Three hundred-foot tunnel shows sulphide ore. Surface indications of other ore bodies. Prospect. Idle.

Bibl.: Bull. No. 50, p. 84.

Morris, consists of 120 acres, in Sec. 10, T. 34 N., R. 3 W., in the Pittsburgh mining district, about 2½ miles north of De La Mar, and in the Shasta Forest Reserve. Owner, W. H. Barkhurst, of Redding. Ore similar to Bully Hill. Two tunnels, 400 feet and 80 feet in length. Prospect. One man working.

The Mountain Copper, formerly known as Iron Mountain, is the pioneer copper mine of the Shasta County copper belt. The holdings, consisting of several hundred acres, patented, are located in Secs. 34 and 35, T. 33 N., R. 6 W., M. D. M., 11 miles by railroad northwest of Keswick. Owners, Mountain Copper Company of London, England. F. B. Lawson, chairman of board of directors; A. N. Frewer, secretary; W. F. Kett, general manager; W. L. Cole, superintendent. This company controls a large acreage on Iron Mountain, between Slick Rock and Boulder creeks. Elevation varies from 2400 to 3200 feet. The mine is opened up by thousands of feet of tunnels driven from points high up the sides of the hill, and the ore has been stoped from a large portion of the ore body on the south side. Country rock is rhyolite and quartzite.

Deposit consists of massive lenses, with "gossan" (reddish oxide capping) on the surface, and below the capping a heavy grayish sulphide, carrying copper, gold and silver. Equipment consists of 11 miles of narrow gauge steam road which hauls the ore from the mine to the railroad (Southern Pacific Railway Company), cars, shops, 75 h.p. electric hoist, pumps, dwellings, etc. Power obtained from Northern California Power Company. The old smelter at Keswick has been dismantled and the ore is now shipped to the company's 350-ton smelter near Martinez. The company owns a large area of timber land on the Pitt River, 65 miles from Keswick, and the timber is floated down the Pitt and Sacramento rivers to this place. There is a large tonnage of ore blocked out in the mine; 350 men employed at present. Splendid success has been made in locating ore by means of the diamond drill. This property was worked in the eighties as a gold and silver mine, and was acquired in 1895 by London capital and the Mountain Mines Syndicate, Ltd., was formed, and in 1897 was transferred to the present Mountain Copper Company, composed practically of the same individual interests. The company has paid several millions in dividends. (For fuller details see Bull. No. 50, pp. 70–78.)

Mountain Monarch consists of 120 acres, in Secs. 28 and 32, T. 32 N., R. 6 W., 2 miles south of Stella, in the Shasta mining district. Owners, Mountain Monarch Mining Company, of Redding. W. P. Aron, president. Ore occurs in meta-andesite, and is 5 feet wide on the surface, principally malachite. A crosscut has been run for a length of over 700 feet, and some ore exposed, but main ore body has not been reached. Idle.

Ohio consists of 120 acres, patented, in Sec. 12, T. 33 N., R. 6 W., 5 miles west of Coram, in the Flat Creek mining district. Owners, Bliss Estate, of New York. Heavy sulphide ore, similar to the Iron Mountain. Several tunnels have been run, longest 530 feet. Idle.

Oregon Consolidated, in Secs. 13, 14 and 23, T. 33 N., R. 6 W., about 6 miles west of Copley. Owners, Scamman et al. Holdings consist of six claims. Development work consists of several tunnels comprising about 1500 feet in all. Some sulphide ore exposed, but the extent of the ore body not determined. Under bond at one time to the Baker Consolidated Copper Company of Detroit, Mich. Idle. Prospect.

Bibl.: Bull. No. 50, p. 113.

Pitt River, consisting of 140 acres, is located in Sec. 25, T. 34 N., R. 3 W., about 3½ miles northeast of Copper City, in the Pittsburgh mining district and in the Shasta Forest Reserve. Owner, E. Popejoy. Ore and formation similar to Bully Hill. Some of the oxide ore on the

surface carries good gold values. One tunnel 500′ long. A little ore shipped to smelter. One miner employed.

Polkingham consists of five claims in Sec. 11, T. 33 N., R. 2 W., 1 mile south of Ingot, in the North Cow Creek mining district and in the Shasta Forest Reserve. Owners, Polkingham Mining Company, of Ingot. R. Polkingham, president. A shaft 100 feet deep has been sunk on the croppings. Little ore in sight, some gold values in oxidized zone. Idle.

Bibl.: Bull. No. 50, p. 111.

Popejoy, in Sec. 25, T. 34 N., R. 3 W., 3 miles northeast of Copper City, in the Pittsburgh mining district and in the Shasta Forest Reserve. Owner, W. Randall. The holdings, consisting of 100 acres, adjoin the Pitt River claims. Base ore similar to Bully Hill, extent of ore body not determined as development work confined to several short tunnels. Prospect. Idle.

Roseman consists of nine claims and a smelter site, in Secs. 3 and 34, T. 33 and 34 N., R. 4 W., about 6 miles east of Kennett. Owner, H. Roseman et al., of Redding. Ore occurs in or near a lime deposit, the footwall apparently being in serpentine. The formation has nothing in common with either the West Side district or the Bully Hill. Workings mainly along the outcrop, consisting of short tunnels. Idle.

Bibl.: Bull. No. 50, p. 109.

Shasta King constitutes the principal mining holding of the Trinity Copper Company, a Boston corporation; T. W. Lawson, president. The property consists of eighty-four patented claims, 580 acres on Squaw Creek and 800 acres of placer, mineral and timber lands, in Secs. 11, 12, 23, 24, 25 and 26, T. 33 N., R. 6 W., 7 miles west of Kennett. The Shasta King workings face the Balaklala, but are several hundred feet below it. The property was acquired in 1900 and development work pursued on an extensive scale for some years. The ore body has been opened up by tunnel levels, cutting it on the main level for over a distance of 1000 feet around the mountain side, and these have been connected by drifts along the footwall. The large ore body of a massive sulphide character, similar to the Balaklala, outcrops on the mountain side, forming one half of Squaw Creek canyon, course of which at the mine is east and west. The gossan croppings are very prominent and can be followed several thousand feet. A large tonnage of ore said to be blocked out. A double track incline 850′ long handles the ore from the mine to the Balaklala aerial tram. The equipment consists of large ore bins at the mine and at Coram, shops, dwellings, and a large office building in Kennett. No mining work being pursued at present. Three men employed as watchmen.

Bibl.: Bull. No. 50, p. 87.

Shasta May Blossom, formerly known as the Keith, consisting of twenty-two claims, is located in Sec. 14, T. 34 N., R. 3 W., ½ mile north of De La Mar, in the Pittsburgh mining district. Owners, Shasta May Blossom Copper Company, of Fruitvale; M. Lindley, president. Vein matter is a spar-schist footwall and granitic-porphyry hanging. A body of gossan croppings 30 feet wide is found near the top of the hill. Development work consists of 7 tunnels, aggregating 2000 feet, and several open cuts. Prospect. Two men employed.

Bibl.: Bull. No. 50, p. 100.

Spread Eagle, consisting of twenty-seven claims, in Sec. 13, T. 33 N., R. 6 W., 4 miles west of Coram, in the Flat Creek mining district, have been recently purchased by the Mammoth Mining Company. Former owner, W. G. Onn, of Copley. Development work consists of eight tunnels, aggregating about 3000 feet. Some good ore in sight.

Bibl.: Bull. No. 50, p. 85.

Stevenson consists of 140 acres, in Sec. 14, T. 33 N., R. 6 W., 3½ miles west of Coram, in the Flat Creek mining district. Owner, C. Butler. Only slightly developed by means of short tunnels and open cuts. On the main copper belt. Gossan croppings well defined.

Stowell, formerly known as the Grab, and also as the Webster Consolidated, is one of the old locations on the West Side copper belt. It consists of three claims in Sec. 14, T. 33 N., R. 6 W., 4 miles west of Coram, in the Flat Creek mining district. Owners, Stowell Estate, of Redding. Workings consist of short crosscut tunnels, aggregating about 800 feet of development work, but none has reached the objective point. One man working.

Bibl.: Bull. No. 50, p. 85.

Sugar Loaf, formerly known as the Galvin, consists of 340 acres, in Secs. 25 and 26, T. 33 N., R. 6 W., immediately northeast of the Mountain Copper Company's holdings, on Sugar Loaf Mountain, the first prominent outcrop on the copper belt after leaving the Iron Mountain mines. The formation is the same as that encountered elsewhere on the belt. Croppings of gossan, 400 feet wide in places, indicate the presence of ore bodies in the rhyolitic rocks. It is owned by the Copper Mountain Consolidated Mining Company, of Redding; J. Pilluis, president; F. Grotefend, secretary. The development work consists of twelve tunnels, aggregating over 4000 feet. No definite ore body exposed as yet. Equipment consists of air compressor, shop and dwellings. Electric power obtained from Northern California Power Company. Three men employed.

Bibl.: Bull. No. 50, p. 84.

Sulphide consists of four claims, in Sec. 16, T. 32 N., R. 6 W., ½ mile from Stella, in the Shasta mining district. Owner, J. F. Conkling. A shallow exploration tunnel run along a contact shows up low grade sulphides carrying a little gold. Prospect. Idle.

Summit Group, owned by the Stauffer Chemical Company of San Francisco, is located in Sec. 30, T. 34 N., R. 5 W., 4 miles northwest of Kennett, in the Backbone mining district. Chas. Kunze, of Kennett, superintendent. This property is situated on the eastern slope of Bohematosh Mountain, and adjoins the Mammoth Company's holdings on the west. The country rock is heavily mineralized, and the ore body is the same in character as the more southerly part of the copper belt. Extent of ore body not determined, but is over 30 feet wide in places. The workings consist of three tunnels, one 400 feet long, and a 350-foot raise. A 4-drill Sullivan compressor, shop and dwellings constitute the surface equipment. Five men employed.

Bibl.: Bull. No. 50, p. 97.

GOLD.

The gold production record of Shasta County from 1880 is derived principally from two sources—the smelting of base ores, and the milling of quartz (siliceous ores).

The closing down of all but one of the smelters has caused a material decrease in the amount of gold produced, and several of the quartz mines supplying ore to these plants have stopped operations also. Adjacent to different parts of the copper belt are gold quartz districts, in which are many veins carrying low, medium, or high grade ores, which are base, as a rule, and can not be efficiently and profitably reduced by milling processes. They occur notably in the vicinity of the old town of Shasta, 4 miles south of Iron Mountain, and are distributed for several miles south and east of this end of the belt, especially through the Shasta, Flat Creek and Old Diggings districts. In fact, gold quartz veins are abundant in close proximity to the copper belt generally, and the smelters have created a market for these ores and enabled the development of a number of quartz properties.

In 1912 the quartz mines produced $702,267 in gold and $4,200 in silver, while the copper smelters yielded $220,775 gold and $420,894 silver.

French Gulch, 21 miles northwest of Redding, the most active quartz mining district in Shasta County, produced $380,305 in gold in 1912, or over 50% of the gold yield from siliceous ores. The Gladstone, one of the famous quartz mines in this county, is the largest producer in this district, next in order being the Milkmaid and Franklin, Brunswick, El Dorado and Eureka, Halcyon, Summit, and Washington.

The *Midas,* another famous quartz mine, is the only gold producer in the Harrison Gulch district.

There are also a few small quartz producers near Stella, Buckeye, Igo, Kennett, Keswick and Ono.

Placer mining is very limited, the dredging operations near Redding affording the largest output. A small production is reported from the placers at French Gulch, Bayles (Delta), and Lamoine.

HISTORY.

Reading, of Trinity fame, gave his name to the district which sprang up in 1849 around Clear Creek and lifted Shasta City to prosperity. In this district, centering around Shasta, were a number of camps along and near Clear Creek, the most famous being Horsetown, which passed out of existence years ago. The bed of the creek proved rich and by the autumn of 1850 several dams were placed to turn the current. This stream is now being worked by means of a dredge.

The main Sacramento River toward Soda Springs, acquired fame chiefly in 1850 when Dog Creek and other tributaries lured the prospector. Dredging operations are being pursued at the present time on the Sacramento River, just above Redding.

Placer gold was discovered in the region of Bully Hill as early as 1853, which became known as the Pittsburgh district. With this discovery began a stampede which resulted in the location of a large number of placer claims, many of which were of little value, and active interest lapsed before 1870.

In 1862 gold was discovered in the surface rock near Copper City, and when the ore was found to contain silver as well as gold, there was another rush into this district and a search begun for the supposed rich veins of gold and silver. Bully Hill was located at this time.

Eight quartz mills, comprising a total of 60 stamps, had been erected in this county prior to the year 1896, three mills (40 stamps), being in operation in French Gulch at that time.

The *Washington Mine,* near French Gulch, discovered in 1852, is said to be the first quartz location in Shasta County, and in 1869 had the largest mill, consisting of 22 stamps. This property is still worked in a limited way and a small production obtained. All the old workings are caved.

In 1877 a mill was erected at Copper City to work ore from the Bully Hill, and during a period of three years over $640,000 was produced, the surface ore only being worked.

The principal gold quartz deposits are fissure veins, generally narrow, having steep dips, and occurring either in slate or in meta-andesite, and associated as a rule with porphyry dikes. The usual trend of the fissure is east and west, though minor variations are found occasionally.

GEOLOGY OF DISTRICTS.

The deposits in the French Gulch district lie within the area of slate and conglomerate, generally associated with intrusive granite porphyry dikes. The workings in the Gladstone mine clearly demonstrate the persistency of the ore bodies with depth.

A good wagon road connects French Gulch with Redding, the county seat and freight terminal for this district. The haul is about 21 miles over an easy grade.

The line of the Northern California Power Company passes through the district, so that cheap electrical power is at hand.

The topography of the county is such as to afford good tunnel sites. Mining operations can be pursued throughout the entire year. The cost of mining is reasonable.

Bibl.: Report X, p. 635; U. S. Geol. Surv., Bull. No. 540, pp. 31, 55, 56.

In the vicinity of *Stella,* 11 miles northwest of Redding, the fissure veins cut the quartz diorite and alaskite porphyry, and the pay ore is apparently found along the edge of the latter. This district is said to rank next to French Gulch in total gold output. At the present time none of the properties are being worked on an extensive scale, hence the output is small.

Bibl.: U. S. Geol. Surv., Bul. No. 540, p. 47.

In the *Dog Creek District* the deposits are all within the areas of meta-andesite, cut by dikes of feldspathic dacite porphyry and occasionally alaskite. The pay ores exposed in the development work consist of irregular shoots, but the extent of these bodies has not been determined as yet. Delta, the nearest railroad point, is on the edge of this district, and a narrow gauge railroad extends from this station westerly for a distance of 7 miles. A number of promising quartz properties have been developed to a limited extent in this district, and the numerous ledges of pay ore should lead to considerable production in the near future.

Bibl.: U. S. Geol. Surv., Bull. No. 540, p. 71.

The gold zone extends from the base ore belt, southwesterly, to the extreme boundary of Shasta County, including Igo, Ono and Harrison Gulch districts.

The *Igo District* is 13 miles southwest of Redding, and some good placer ground has been worked in this section. The débris law has stopped hydraulic operations. The quartz mining has been carried on to a limited extent. The pay shoots are short but carry good values in gold. Good wagon road from Redding to the town of Igo. The same general conditions apply to Ono, some 7 miles west of Igo.

The *Harrison Gulch District,* 50 miles southwesterly from Redding near the Trinity County line, is known principally on account of the Midas mine. Here the ore occurs in slate, near a porphyry dike, and considerable evidence of faulting is found. The pay shoot has an average width of 12 inches. The haul is rather expensive, as two mountain ranges must be crossed.

The *Squaw Creek District,* extending westerly from Kennett, contains both base and free milling ores. The Uncle Sam gold mine is in this district. Rich pockets are often found along the contact of slate and meta-andesite and many prospectors have made a stake by "pocket hunting." The direct cause of several of the failures in lode mining is due to the installation of mills more elaborate than the size of the ore body justified.

Bibl.: Report X, p. 639.

AURIFEROUS GRAVEL.

An immense deposit of auriferous gravel, commencing southwesterly from the city of Redding, in Sec. 36, T. 31 N., R. 6 W., near the old site of Horsetown and trending east to the foothills of the Lassen Buttes and down the Sacramento Valley, has been extensively worked in the past.

Oregon Gulch, about 10 miles in length, was exceedingly rich and was worked from its source to the valley. It empties into the Sacramento River 1½ miles south of Redding.

Onley Creek, another rich stream, heads in the Muletown Mountains, runs in a southeasterly course and empties into the Sacramento River about 1 mile south of Oregon Gulch.

An old river bed, having a general northeast and southwest course, and crossing the Sacramento River one mile north of Redding at right angles has been traced from the northeast to the western boundary of the State. It passes through the old site of Horsetown, thence westerly and southeast of Igo; here it turns to the southwest and passes through the old town of Ono, and can then be traced from here to Watson's Gulch, and thence into Arbuckle. This channel can be distinctly observed on the top of Arbuckle Mountain, 3000 feet above sea level; from which point it takes a short bend and runs in a westerly direction to Knob Gulch and can be traced up this gulch for over 10 miles. The placers of Knob Gulch were very rich where the channel crossed it. Upon approaching the Chauchalua Mountains all traces of the river bed disappear and are not again visible until Hay Fork, in Trinity County, is reached. From that point it takes its regular course, passes through Humboldt County and empties into the Pacific Ocean at Gold Bluff.

Hazel Creek, some 15 miles long, was worked in early days throughout its entire length, the gravel being very rich. This stream, after flowing southwesterly through country rock of slate and granite, empties into the Sacramento River in Sec. 18, T. 37 N., R. 4 W., near Sims Station.

DREDGING.

There are several thousand acres of dredging ground along Clear Creek and the Sacramento River. Some of the land adjacent to the town of Igo is being drilled to determine dredging possibilities. Only two dredges are in operation in Shasta County at the present time, one on Clear Creek a few miles below Redding, and the other on the Sacramento River just above that city. The ground along Clear Creek, on which dredging is being pursued, averages 20 feet in depth, the gravel being loose river wash, carrying few large boulders and only a little clay. The contour of the ground is fairly even and the timber growth is scattered. The gold is generally fairly coarse and worth about $19 per ounce. Conditions for economical working are very favorable.

Suction dredges have been operated along the Sacramento River, above Redding, and also along Clear Creek, but with poor success.

William Desilhorst successfully operated a steam scoop along Clear Creek for several years, but the best ground has evidently been worked out as the plant has been idle for some time.

Bibl.: Bull. No. 57, pp. 213–218.

GOLD MINES—QUARTZ AND PLACER.

Accident, formerly known as the *Sybel,* consists of 80 acres, patented, in Sec. 7, T. 33 N., R. 7 W., about 5 miles northwest of French Gulch, in the French Gulch mining district. Owners, Accident Gold Mining Company; home office, Redding; G. E. Garwood, president. Elevation at mine workings 3700 feet. Three veins on claims. Slate foot and diorite-porphyry hanging-walls. Strike N. 80° W., dip 50° N. Ore shoot 100 feet long and 3 feet wide, free milling. Workings consist of a tunnel 2200 feet long, 400 feet of drifts, and a 100-foot stope. Reduction equipment consists of a 4-foot Huntington mill, operated by steam power. Property said to have been a producer. Idle. Prospect.

Bibl.: U. S. Geol. Surv., Bull. No. 540, pp. 68–69.

Advance Consolidated, consisting of 135 acres (20 acres patented), is located in Sec. 2, T. 35 N., R. 6 W., 7 miles west of Delta, and ½ mile from the Delta Consolidated Railroad, in the Dog Creek mining district. Owners, Advance Consolidated Mining Company of San Francisco. Three parallel veins on this group 4 feet wide. Ande-

site footwall and diorite hanging, strike east and west, dip vertical. Pay shoot 400 feet long and 4 feet wide, free milling. Workings consist of four tunnels on the vein from 50 to 1100 feet long, and 1000 feet of drifts, stopes and raises. Reduction plant consists of old rolls (six in number), crusher, 50-ton cyanide plant (failure). Small producer. Considerable money expended on plant and in experimenting with the ore. Delta Consolidated to the east, and Trinity Consolidated to the south. One man working.

Alice, consists of 120 acres, in Sec. 19, T. 32 N., R. 5 W., 1 mile southwest of Keswick, in the Shasta mining district. Owner, F. Bonte. Three parallel veins 3 feet wide, strike N. 60° E., dip S. 75° E., granitic-porphyry walls. Pay shoot 80 feet long and 3 feet wide, free milling. Best ore has a width of 8 inches. One tunnel 600 feet long on the veins, short stope and 200-foot drift. Reduction equipment consists of an old 4-stamp mill (850-pound stamps). Idle. Small producer at one time. Three men doing some prospecting work.

Bibl.: Reports XII, p. 245; XIII, p. 349.

Al Toland, consists of 60 acres, in the Shasta Forest Reserve, in Sec. 28, T. 36 N., R. 6 W., 7½ miles west of Delta and 1½ miles west of Delta Consolidated Railroad, in the Dog Creek mining district, Owner, A. L. Toland. Elevation 3700 feet. One vein on claims, width 2½ feet, strike NW. and SE., dip 45° SW., pay shoot 110 feet long and 2½ feet wide, free milling. Workings consist of several short tunnels. Main tunnel 200 feet long and 180-foot winze at face of same; short drift and stope. Old 2-stamp mill, steam driven. Idle. Small producer, some high grade. Two men employed.

American Mine, formerly known as the *French Gulch,* adjoins the Gladstone on the west, the workings consisting of tunnels at several elevations between 2500 and 3150 feet on the north ridge of Cline Gulch. This group is located in Secs. 12 and 13, T. 33 N., R. 7 W., 3½ miles northeast of French Gulch, in the French Gulch mining district. The holdings consist of 60 acres, patented, and 40 acres held by location. Owners are W. Franck et al., of French Gulch. The country rock consists of slate and conglomerate. Fissure vein has a strike of N. 63°–80° W., and a dip of S. 75° E.; slate walls. Pay shoot 125 feet long and 2 feet wide, free milling. Length driven on vein 1400 feet in tunnel, greatest depth 650 feet; four tunnels from 50 to 1400 feet in length; one stope 125 feet long and 240 feet in height; 80-foot winze and 300-foot raise. Mining and filling method used. Some of the old workings caved. Mine equipment consists of ¼ mile single track tram (mine to mill), cars, shop and dwellings. The old 10-stamp mill, steam driven, is idle. Two men employed doing prospect work. Property said to have produced $300,000. Rich ore worked

from the surface. Located in 1886, and sold to a San Francisco company which became involved in financial difficulties, and finally acquired by the present owners, the creditors. Not worked on any scale since 1908.

Bibl.: Reports, VIII, pp. 564–565; X, p. 637; XII, p. 245; XIII, p. 349; U. S. Geol. Surv., Bull. No. 540, pp. 35, 60–61.

Atlantic, consists of 100 acres, in Secs. 17 and 20, T. 31 N., R. 6 W., 3 miles northwest of the town of Igo, in the Igo mining district. Owner, W. L. Kingsbury. Two parallel veins about 150 feet apart have been worked in a small way. Pay shoot 70′ long and 15″ wide, in granite. One tunnel on vein for a distance of 440 feet. A little ore shipped to Selby smelter gave returns of $80 per ton in gold. Small producer. Two men employed.

Australia, consists of 80 acres, in Secs. 19 and 30, T. 32 N., R. 6 W., 3 miles north of the old town of Shasta in the Shasta mining district. Owner, M. Garrecht. Elevation at main tunnel 1300 feet. Three veins, two parallel, on the claims; only parallel veins have been worked. Strike east and west, dip 60° N., meta-andesite footwall and granitic porphyry hanging. Pay shoot 60 feet long and 4 feet wide. Workings consist of three tunnels on the veins, longest tunnel 340 feet with a 40-foot winze at the face. Old 3-stamp mill, driven by water power from Brandy Creek (ditch 1 mile long), is idle. Stamps weigh 850 pounds each. Small producer. Two men employed.

Bibl.: Report XIII, p. 362.

Black Bear, consists of 80 acres, in Sec. 9, T. 29 N., R. 10 W., 1 mile south of Harrison Gulch, in the Harrison Gulch mining district. Owners, W. D. Lilly et al., of Redding. One vein 5′ wide in slate, only slightly developed. Two short tunnels.

Black Hawk, consists of 80 acres in Sec. 14, T. 31 N., R. 6 W., about 1 mile northwest of Centerville, in the Igo (formerly South Fork) mining district. Owner, W. Dunham. One vein, meta-andesite walls, only small amount of development work by a tunnel 400′ long. Little ore taken out. Idle. Prospect.

Black Spider, consists of 80 acres, in Sec. 19, T. 32 N., R. 5 W., about 1½ miles southwest of Keswick. Owner, R. Bell. Workings consist of old shaft 460 feet deep, a 420-foot tunnel, and short drifts. Ore shoot 160 feet long and 6 feet wide, free milling, but low grade. Little ore extracted. Idle. Alice prospect to the east.

Bibl.: Reports XII, p. 246; XIII, p. 350.

Bodie, in Secs. 6 and 32, T. 32 and 33 N., R. 7 W., about 3 miles southwest of French Gulch, in the French Gulch mining district, consists of 40 acres, at an elevation of 3800 feet. Owner, F. B. Rossi.

Vein occurs between a granodiorite footwall and a granitic-porphyry hanging. Pay shoot 250 feet long and 2 feet wide, free milling. Workings consist of a tunnel 560 feet long on the vein, 400 feet of drifts, stope 110 feet in length and a 40-foot shaft (caved). Old 5-stamp mill has been removed from the property. Small producer at one time. Idle.

Bonanza, in Sec. 6, T. 32 N., R. 6 W., 4 miles northwest of Stella (old Whiskeytown), consists of 60 acres, at an elevation of 1600 feet. Owner, M. C. Dewey et al., of Stella. Three veins, two parallel about 300 feet apart, and one cutting these at an angle of 40°. The vein that has been worked has a north and south strike, and dips 50° southeast, slate footwall and granitic-porphyry hanging. This vein is cut by a diorite dike 20 feet wide, with an east and west strike. Pay shoot is 120 feet long and 14 inches wide. Workings consist of three tunnels about 50 feet apart—lower 180 feet long, middle 120 feet, and upper 60 feet long. Bright Star to west. Idle.

Bright Star, formerly known as the *Iron Mask,* consisting of 120 acres, is located in Sec. 31, T. 32 N., R. 6 W., about 4½ miles northwest of Stella, in the Shasta mining district. Owner, S. W. Levy, of San Francisco. Elevation 2400 feet. The vein has a north and south strike, and a dip of 60° E., slate footwall and granitic-porphyry hanging. Pay shoot said to be 200 feet long and 16 inches wide. Workings consist of two tunnels. Main tunnel on vein is 900 feet long and crosscut 180 feet in length, also 450 feet of drifts and a stope 200 feet long. Old 5-stamp mill idle, driven by water; ditch 2 miles long, from Whiskey Creek. Property has been a producer but idle at present. Bonanza to the west.

Bibl.: Report XII, p. 250; U. S. Geol. Surv., Bull. No. 540, p. 55.

Brunswick, consists of 100 acres, in Sec. 20, T. 33 N., R. 7 W., 5 miles west of French Gulch, in the French Gulch mining district. Elevation 3200 feet. Owners, Brunswick Mining Company. Two parallel veins. Strike east and west, dip 60° N., quartz-porphyry footwall and slate hanging. Pay shoot said to be 250 feet long and 6 feet wide, free milling. About 6 inches of good ore on hanging-wall side. Five tunnels run on the vein, from 100 to 800 feet in length, 700 feet of drifts, a stope 200 feet long and several open cuts, constitute the development work. Old 5-stamp mill idle. Said to have produced $100,000. Idle.

Bibl.: Report XIII, p. 351; U. S. G. S., Bull. No. 540, pp. 35, 37, 68.

Bulwer and *Virginia,* in Sec. 18, T. 33 N., R. 7 W., 5 miles northwest of French Gulch, in the French Gulch mining district, consists of 40 acres. Elevation 2400 feet. Owners, J. Reinhaus et al., of French

Gulch. Three parallel veins on the claims, strike north and south, dip 65° E., granitic-porphyry footwall and slate hanging. Ore shoot 200 feet long and 2 feet wide, free milling, 700-foot tunnel on the vein. Little ore extracted. Idle.

Bunker Hill consists of 60 acres, patented, in Sec. 29, T. 32 N., R. 5 W., 3 miles east of Shasta, in the Shasta mining district. Owners, Pryor and Logan. Elevation 1000 feet. One vein 5 feet wide, strike north and south, dip 40° E., granitic-porphyry walls. Workings consist of a tunnel 460 feet long and 200 feet of drifts. Idle.

Calumet Consolidated, consisting of 80 acres of patented mineral land, is located in Sec. 20, T. 32 N., R. 5 W., about 1 mile south of Keswick. Owners, Dr. Garlick et al., of San Francisco. Elevation at tunnel 750 feet. Only one of the several veins on the claims has been worked. Strike is east and west, dip 15° N., diorite walls. Pay shoot over 200 feet long, with an average width of 20 inches. Ore is free milling near the surface, but tends to become base with depth (copper sulphides). Maximum depth on vein about 250 feet. The workings consist of a tunnel on the vein 1100 feet long, several hundred feet of drifts, raises and stopes. The reduction equipment consists of a 40-stamp mill (old), steam driven, four Frue vanners, and an old 10-ton chlorination plant. Mine was a producer at one time, but has not been worked in recent years. Inez to north.

Bibl.: Reports, VIII, p. 563; X, p. 631; XI, pp. 43, 395.

Carnegie Group, Ltd., formerly known as the *Clipper* and *Snider,* is located in Sec. 1, T. 33 N., R. 6 W., 7½ miles west of Kennett, in the Flat Creek mining district. The group, consisting of 120 acres, patented, is owned by A. Di Nola et al., of San Francisco. Elevation 2300 feet. The vein has an east and west strike and dips 45° N., average width 2½ inches; granitic-porphyry walls. Pay shoot 200 feet long and 2½ feet wide, free milling. The workings consist of a shaft 230 feet deep, with three levels at 50′, 150′ and 200′, drifts, 50-foot raise, and a stope 130 feet long, as well as a 460-foot tunnel, all on the vein. The reduction equipment consists of a 10-stamp mill, steam driven, two Frue vanners and blanket table. Idle. Property has been a producer but idle at present. Some ore in sight. Mentioned in our eleventh, twelfth and thirteenth reports.

Central, consists of 80 acres, patented, in Sec. 33, T. 33 N., R. 5 W., 2½ miles east of Copley, in the Flat Creek mining district. Owner, A. A. Anthony, of Whitehouse. Elevation 1500 feet. Two parallel veins about 150 feet apart on the claims, strike north and south, dip 40° E., quartz-porphyry walls. Pay shoot 230 feet long and 6 feet wide, free milling near the surface but base with depth (copper sulphides). Workings consist of a tunnel on the vein, 1340 feet long, 900

feet of drifts and one stope. Old 6-foot Huntington mill, steam driven, Some production from the oxidized ore near the surface. Idle.

Bibl.: Reports, VIII, pp. 565-566; X, p. 631; XII, p. 246; XIII, p. 351.

Chapman and *Voluntine* (drift and hydraulic) mine, consists of 100 acres, patented, in Sec. 25, T. 36 N., R. 6 W., ¾ of a mile south of Centerville. Owner, C. A. Chapman of Redding. Course of channel, northeast and southwest, soft granite bedrock. Pay gravel about 20 feet deep. Worked as a drift mine for some years, and then as a hydraulic proposition. Water obtained from Happy Valley ditch. Good producer until operations were stopped some twelve years ago on account of the debris law. Some good ground yet to be worked. Princess placer to the southwest.

Clara, consisting of 60 acres, patented, is located in Sec. 17, T. 32, N., R. 5 W., ½ mile west of Keswick. Owner, O. La Platte. Elevation 1000 feet. Three parallel veins, granitic-porphyry walls. Pay shoot 160 feet long and 20 inches wide, free milling. Tunnel on main vein 700 feet long. A little high grade extracted. Prospect. Idle.

Cleveland, consists of 60 acres, patented, in Sec. 15, T. 32 N., R. 5 W., 4 miles west of Redding, in the Shasta mining district. Owner, D. H. Hunt, of Redding. Elevation 800 feet. Vein is 15 inches wide between diorite walls, strike northwest, dip S. 60° W. Pay shoot said to be 200 feet long and 15 inches wide. Ore is base, carrying gold with sulphides of copper, lead and iron. Worked for gold. Some rich ore shipped to smelter. Only slightly developed by 200-foot tunnel, drift and stope. Idle.

Climax, consists of 60 acres, in Secs. 16 and 21, T. 31 N., R. 6 W., about 3 miles northwest of Igo. Owner, S. W. Robinson. One vein in granite. Ore shoot short, free near surface but base with depth. Only limited amount of development work by means of short tunnels. Old Justin mill dismantled. Has been a small producer. Worked a few months each year. Prospect.

Colorado, in Secs. 16 and 17, T. 33 N., R. 7 W., 3 miles northwest of French Gulch, in the French Gulch mining district, consists of 80 acres. Elevation 1600 feet. Owner, T. McDonald of French Gulch. Vein is 10 inches wide, strike northeast and southwest, dip 40° N., granite-porphyry footwall and slate hanging. Ore shoot 160 feet long, free milling, 400-foot tunnel on the vein. Idle.

Compton, consists of 40 acres, in Sec. 20, T. 32 N., R. 5 W., 1¼ miles south of Keswick, in the Shasta mining district. Owner, G. F. Bassett. Elevation 900 feet. One vein in granitic-porphyry. Short pay shoot. Slightly developed by short tunnel and drift. One man working.

Consolidated Gold Dredging Company, operating along the Sacramento River, own 260 acres, in Secs. 20 and 28, T. 32 N., R. 5 W., about 1½ miles northeast of Redding. W. F. McClure is president of the company, and W. D. Egilbert, superintendent of dredge. Course of channel is north and south, slate bedrock, hard and tilted. Depth of pay gravel from 8 to 20 feet. Dredge equipped with 5-foot buckets and handles about 50,000 cubic yards of gravel per month. Power is obtained from Northern California Power Company. Twelve men employed.

Consolidated Kascinaska, formerly known as *Quartz Hill,* in Sec. 10, T. 32 N., R. 5 W., 4 miles southwest of Redding. Owners, Kascinaska Mining Company, Chicago, Illinois. Holdings consist of 80 acres, patented, at an elevation of 950 feet. Two parallel veins strike N. 40° W., dip 50° W., slate footwall and quartz-porphyry hanging, width of vein 8 inches. Pay shoot 140 feet long and 4 feet wide, free milling, low grade. Workings consist of several tunnels from 50 to 480 feet long, drifts and stopes. Idle for several years. Mentioned in our Twelfth and Thirteenth Reports.

Copley, consists of 60 acres, in Sec. 32, T. 33 N., R. 5 W., near the town of Copley, in the Flat Creek mining district. Owner, J. R. King. Elevation 860 feet. Worked the oxidized ore on the surface for the free gold, but with depth the ore became base, still carrying best values in gold. One vein, strike northeast and southwest, dip 60° NE., width 4 feet. Length of pay shoot not determined. Workings consist of 310-foot tunnel, 60-foot drift and stope 60 feet long. Owner doing assessment work.

Bibl.: Report XIII, p. 352.

Corrine, consists of 160 acres, in Sec. 32, T. 32 N., R. 5 W., 1 mile west of Redding, in the Shasta mining district. Owners, E. P. and J. C. Connor of Redding. Elevation 800 feet. Two parallel veins, strike northeast and southwest, dip vertical. Pay shoot 200 feet long and 15 inches wide, free milling, carrying rich sulphurets. Workings consist of four tunnels from 60 to 430 feet long, and old 110-foot shaft, 600 feet of drifts and a stope 160 feet long. Reduction equipment consists of 5-stamp mill (750-pound stamps), and one Wilfley table. Idle. Property was a producer at one time. Two men at work.

Cortez, consisting of 65 acres, is located in Sec. 10, T. 33 N., R. 2 W., ½ mile northwest of Ingot, in the North Cow Creek mining district. Owner, A. J. Cook, of Ingot. Elevation, 1400 feet. Two parallel veins about 40 feet apart. Length of pay shoot not determined. Vein on contact between rhyolite and shale. Three short tunnels on veins. Afterthought copper mine to northeast. One man working.

Bibl.: Reports, XII, p. 70; XIII, p. 352.

Crystal, consists of 60 acres, in Sec. 17, T. 31 N., R. 6 W., 3 miles northwest of Igo, in the Igo mining district. Owners, Kingsbury & Hubbard. Three parallel veins in granite. Ore is a grayish gold-silver sulphide. Pay shoot short and values are not uniform. Only slightly developed with short tunnels. A little ore shipped to smelter gave returns of $50 per ton in gold and silver. Worked a few months during the year. Prospect.

Delta Consolidated, the largest quartz property in the Dog Creek mining district, is located in Secs. 1, 3, 6, and 31, T. 35 and 36 N., R. 5 W., 6½ miles west of Delta. The holdings consist of 650 acres (80 acres patented timber land) in the Shasta Forest Reserve. Owners are the Delta Consolidated Mining Company of Redding. S. T. White, president; S. D. Furber, secretary. Elevation varies from 2800 to 3000 feet. The mine is connected with Delta, a station on the Oregon branch of the Southern Pacific Railroad, by means of a narrow guage railroad, 6½ miles long, constructed by the company. There are 10 veins on the claims. The principal lodes, known as the Pioneer, Rickard, Scorpion, Black Oak and Caledonia, have a strike of N. 70° E., and a vertical dip, and can be traced on the surface for several thousand feet. The walls are andesite. Pay shoot is said to be 800 feet long and 18 inches wide, free milling. Maximum depth on ore body is 300 feet. Workings consist of several tunnels on the veins, from 20 to 1600 feet in length, drifts, nine raises from 100 to 200 feet high, and a stope 200 feet long. Mine equipment consists of cars, one Climax geared engine, tools, shop and dwellings. The reduction equipment consists of three separate mills, with a total of 10 stamps, operated by water power obtained from Dog Creek. Ore reserve estimated at 20,000 tons. Cost about $4.25 per ton to work. Ample timber at hand. Three men employed at present, but force to be increased shortly. Rich ore worked years ago in an arrastra. Advance Consolidated to the west, and Trinity Consolidated to the south.

Bibl.: Report XIII, p. 353.

Diamond, formerly known as *Black Prince,* consists of 80 acres, in Sec. 18, T. 31 N., R 6 W., 4 miles northwest of Igo, in the Igo mining district. Owner, S. W. Robinson. Four veins on the group, but only one, the Black Prince, has been worked. Granite footwall and meta-andesite hanging. Pay shoot 100 feet long and 2 feet wide, ore base below the surface. A tunnel 400 feet long, short drifts, and one stope on the vein. Ore shipped to smelter gave returns of $50 per ton in gold and silver. Prospect being worked by Roberts & Wheeler of Igo, under a lease.

Bibl.: Report XIII, p. 355.

Edna B., in Sec. 6, T. 31 N., R. 5 W., 1½ miles east of Shasta, in the Shasta mining district, consists of 100 acres, owned by J. H. Beecher of Anderson. Elevation 1300 feet. One vein 3 feet wide, quartz-poryhyry walls, strike northeast and southwest, dip 45° E. Pay shoot 200 feet long and 3 feet wide, free milling. Workings consist of a tunnel 500 feet long on the vein and 400 feet of drifts. Small producer at one time. Idle.

Bibl.: Reports XII, p. 247; XIII, p. 355.

El Dorado and Eureka, consisting of 40 acres, is located in Sec. 3, T. 32 N., R. 7 W., 3½ miles south of French Gulch, in the French Gulch mining district. Elevation 3000 feet. Owner, J. C. Connor, of Redding. Two parallel veins on claims, slate footwall and quartz-porphyry hanging; strike is northwest and southeast, dip 45° SE. Pay shoot 240 feet long and 3 feet wide, free milling. Workings consist of a tunnel 580 feet long on the vein and 300 feet of drifts. Small producer. Two men employed.

Bibl.: Reports XII, p. 247; XIII, p. 355; U. S. Geol. Surv. Bull. No. 540, pp. 56, 57.

Empire, consists of 60 acres, patented, in Sec. 18, T. 33 N., R. 7 W., 5 miles northwest of French Gulch in the French Gulch mining district. Elevation 3000 feet. Owners, J. E. Franck et al., of French Gulch. Property formerly owned by the Empire Mining Company of Salt Lake City, Utah. One vein has been worked. Strike east and west, dip 15° N. granitic-porphyry footwall and slate hanging. Ore shoot 100 feet long and 6 feet wide. Workings consist of four tunnels from 115 to 500 feet long, 300 feet of drifts and one stope 100 feet long. Old 5-stamp mill, steam driven. Idle. A small producer several years ago. One man working.

Bibl.: Report XIII, p. 356.

Empire, consists of 120 acres, in Sec. 9, T. 30 N., R. 7 W., 3 miles southwest of town of Ono, in the Ono mining district. Owners, McCormick and Murray Estate, of Redding. Two parallel veins exposed on the surface, with slate walls. Pay shoot about 80 feet long and 1 foot wide, ore free milling. Only slightly developed by a tunnel 500 feet long. Little ore shipped to smelter. Idle.

Esperanza, consists of 160 acres, in Sec. 29, T. 29 N., R. 10 W., about 1½ miles east of Harrison Gulch, in the Harrison Gulch mining district. Owner, A. J. Oswald. Four veins exposed on the surface, three being parallel. A shaft has been sunk on the Lucky George claim to a depth of 214 feet, and three crosscuts run, longest 141 feet, working through a fault. A little ore on the surface. A 12 h.p. steam hoist used. Four men employed. Prospect.

Eureka Tellurium, consisting of 290 acres, near Middle Creek, is located in Sec. 32, T. 32 N., R. 5 W., 3 miles southwest of Redding. Owners, Eureka Tellurium Company, J. E. Jarvis, president. Elevation 700 feet. Ten veins on the group, but only one has been worked. Strike N. 25° E., dip 60° E., width 3 feet; walls are slate. Pay shoot 130 feet long and 3 feet wide, free milling on surface, but base with depth. Ore said to contain tellurides. Several tunnels on the vein, main tunnel is 520 feet long. A furnace 5 feet by 20 feet, with 8-foot agitators, 16 barrels, 3 feet by 4 feet, hollow and egg-shaped, and a 4-foot steam filter, with a small precipitating vat, constituted the reduction equipment. Small production from property some years ago. Idle.

Bibl.: Reports, XI, p. 43; XII, p. 248; XIII, p. 356.

Evening Star, consists of 60 acres, patented, in Sec. 4, T. 32 N., R. 5 W., 2 miles southeast of Copley, in the Flat Creek mining district. Owners, Estate of F. Litsch. Three parallel veins, strike N. 50° W., dip 50° S., greenstone footwall and granitic-porphyry hanging. Pay shoot 230 feet long and 14 inches wide, free milling. Development work consists of a tunnel 1100 feet long and 1000 feet of drifts. Three men employed.

Florence, consists of 60 acres, in Sec. 18 T. 30 N., R. 7 W., about 8 miles southwest of Ono. Owner, A. E. Baker. One vein 10 feet wide, has been slightly developed, strike N. 30° W., dip 40° E., slate walls. Ore is low grade and base, carrying some copper, lead and zinc, besides gold. Idle.

Franklin, consists of 40 acres, in Sec. 10, T. 33 N., R. 2 W., 1 mile southwest of Ingot, in the North Cow Creek mining district. Owner, J. A. Cook, of Oakland. Short ore shoot in which some high grade is found. Worked by lessees at times. Only slightly developed by short tunnels.

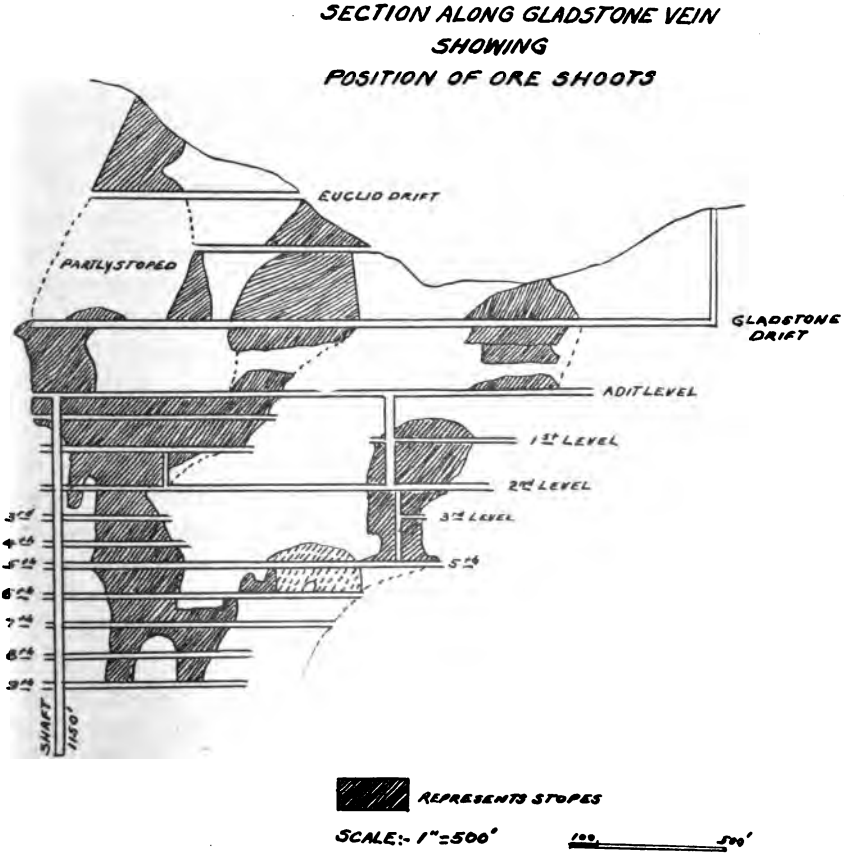
Gambrinus Mine, discovered in 1870, is located in Sec. 16, T. 32 N., R. 6 W., in the town of Stella (Whiskeytown). This well known property is owned by the Shasta Monarch Mining Company, of Redding. T. W. Rogers, superintendent. The holdings consist of 80 acres. Elevation about 1200 feet. There are four parallel veins on the group, three being only 60 feet apart, strike is N. 50° W., dip 45° N., meta-andesite footwall and quartz porphyry hanging. The pay shoot is 220 feet long and 18 inches wide, free milling ore. The workings consist of several tunnels, the main tunnel being 410 feet long on the vein, stopes and drifts, also a crosscut 110 feet long. The mine equipment consists of cars, tools, shop and dwellings. A new 10-stamp mill with two concentrators constitute the reduction equipment, operated by steam

power. Property has been a producer for many years and was worked in the early days by gophering along the rich surface streaks. The tailings are dumped into Whiskey Creek. Ten men employed.

Bibl.: U. S. Geol. Surv., Bull. No. 540, pp. 38, 39, 50, 51.

Garfield, consisting of 80 acres, is located in Sec. 34, T. 33 N., R. 5 W., 2 miles east of Copley, in the Flat Creek mining district. Elevation, 1200 feet. Owner, George Barr. One vein, strike N. 50° E., dip 40° E., quartz-porphyry walls. Ore shoot 90 feet long and 2 feet wide, free milling. One tunnel 570 feet long and 230-foot drift. Small producer. Two men employed. Sam Houston to the north.

Gladstone, the largest quartz producer in Shasta County, is located in Secs. 1, 7, 8, 12 and 18, T. 33 N., R. 6 and 7 W., M. D. M., about 4½ miles northeast of the town of French Gulch, in the French Gulch mining district. The holdings consist of 178 acres, patented, and 485 acres held by location, at an elevation of 2300 feet. It was acquired in 1901 by the present owners, Hazel Gold Mining Company, J. O. Jillson, presi-



dent and manager; E. L. Young, superintendent. The upper 1000 feet of the vein has been mined by means of tunnels, while the lower portion is worked from a blind shaft on the main adit level, and is developed by three levels (see map). The exhausted stopes and upper workings are filled with waste obtained in crosscutting. The country rock consists of slate, conglomerate and sandstone. There are two fissure veins that have been worked, strike east and west, dip vertical, width 3 feet; both walls are slate. The ore shoot is 300 feet long and 3 feet wide, free milling ore. Length driven on vein 2500 feet. Greatest depth 2100 feet. Workings consist of eleven levels below the main adit, the lowest being 1150 feet below the adit; all drifts to the east, No. 3 being the shortest, having a length of 600 feet; raises made from one level to another for air; shaft 1150 feet deep from adit tunnel; several stopes, one being 300 feet long, 4 feet wide and 1100 feet high. Mine equipment consists of new hoisting plant (375 h.p., 2-reel drums), compressor plant, electric cars, shops and dwellings. Electric trains, consisting of ten cars (2200 pounds to a car), haul the ore from the mine to the mill. There are also 9 miles of power and 5 miles of telephone lines on the property. Reduction equipment consists of 30-stamp mill (electrically driven), nine concentrating tables and electroplating plant. All machinery operated with electric power from Northern California Power Company. Stamps weigh 1050 pounds and drop at the rate of 106 times per minute from a height of 6 inches. Mill crushes 100 tons in twenty-four hours, through a 40-mesh screen; 92% extraction is obtained. Tailings dumped into Clear Creek. Company employs 140 men, 40 on top, 90 in mine and 10 in mill. Property produced $3,000,000 since 1901. Original owners of this mine took out $80,000 in high grade. New hoist over shaft will have a steel gallows frame. About 70 gallons of water per minute is pumped with electrical pumps. American mine to the east.

Bibl.: Reports, VIII, pp. 568–569; X, p. 637; XI, p. 45; XII, p. 248; XIII, p. 357; U. S. Geol. Surv., Bull. No. 540, pp. 35, 37, 46, 57–60.

Golden Crown, consists of 80 acres, in Sec. 19, T. 31 N., R. 6 W., 2 miles northwest of Igo, in the Igo (South Fork) mining district. Owners, Dunham & Gilson. One vein 1 foot wide, syenite footwall and granitic-porphyry hanging. Short ore shoot, free milling. Prospect, only slightly developed. Little ore shipped to smelter. Idle.

Great Falls and Hope, consists of 100 acres, in Secs. 7 and 18, T. 31 N., R. 6 W., 4½ miles northwest of Igo, in the Igo (South Fork) mining district. Owner, Mrs. M. Ballou. Elevation 2100 feet. Four veins, three parallel, syenite footwall and granite hanging. Ore shoot 80 feet long and 2 feet wide, free milling. Workings consist of a tunnel

on vein 520 feet long, short drifts and a stope. Little ore shipped. One man employed.

Gray Eagle, consists of 100 acres, in Sec. 10, T. 29 N., R. 10 W., 1 mile south of Harrison Gulch, in the Harrison Gulch mining district. Elevation 3000 feet. Owner, A. E. Johnson. One vein 12 inches wide, slate footwall and diabase hanging. Short ore shoot. Prospect.

Halcyon consists of 40 acres, in Sec. 17, T. 33 N., R. 7 W., 4 miles northeast of French Gulch in the French Gulch mining district. Elevation 2000 feet. Owner, C. L. Watson of French Gulch. Vein has a northeast and southwest strike and dips N. 80° W., slate footwall and tuff hanging. Ore shoot 80 feet long and 1 foot wide, free milling. Developed by means of a tunnel 400 feet long, 500 feet of drifts and 130-foot shaft. A little ore milled. One man working. Prospect.

Hardscrabble Mine (drift and hydraulic), formerly known as the *Piety Hill,* is located in Secs. 27, 34 and 35, T. 31 N., R. 6 W., ½ mile south of Igo, and consists of 1700 acres, patented. Owners, Happy Valley Land and Water Company, of Olinda. A. E. Bowles president. This company owns the old Dry Creek Tunnel and Flume Company's ditch, now known as Happy Valley ditch, which diverts water from the North Fork of Cottonwood, Eagle, Andrews and South Fork of Clear creeks. Course of channel is north and south, slate, sandstone and granite bedrock. Workings consist of old 1500-foot tunnel and several shafts 50 feet deep. Some of gravel 50 feet deep, average 20 feet. About 120 acres have been worked. Operated in the sixties by Alvinza Hayward as a drift and hydraulic mine. Has been a famous producer. Idle for several years. Water supplied to consumers through the old ditch.

Bibl.: Reports, XII, p. 249; XIII, p. 359.

Highland Mine, consisting of 60 acres, is located in Sec. 14, T. 33 N., R. 7 W., 2 miles northeast of French Gulch in the French Gulch mining district. Elevation 2800 feet. Owner, Highland Mining and Tunnel Company, of French Gulch; G. R. Simmons, superintendent. Strike of vein is north and south, dip 20° E., slate footwall and quartz-porphyry hanging. Pay shoot 250 feet long and 3 feet wide, free milling ore. Greatest depth on vein 400 feet in tunnel. Development work consists of several tunnels, 400 feet of incline shaft, drifts and stopes. Main tunnel is 1800 feet long on vein. Old 5-stamp mill is driven by water power; a ditch 3 miles long takes the water out of Clear Creek. Property said to have produced $100,000. Four men employed.

Bibl.: U. S. Geol. Surv., Bull. No. 540, p. 69.

Hope, in Sec. 8, T. 32 N., R. 7 W., 5 miles southwest of French Gulch, in the French Gulch mining district, consists of 60 acres. Elevation 1200 feet. Owners, M. Welch et al., of French Gulch. Ore shoot 100 feet long and 1 foot wide, free milling, slate walls. Workings consist of tunnel 480 feet long, 400 feet of drifts, one stope 80 feet long and 140-foot incline shaft. Rich ore on the surface was worked in arrastra. Idle.

Inez, consists of 120 acres, in Secs. 19 and 20, T. 32 N., R. 5 W., about ¾ of a mile south of Keswick. Owner, W. T. Lee. Ore shoot short. Ore free on the surface but base with depth. Workings consist of a 300-foot tunnel, 100-foot drift and several open cuts.

J. I. C., in Sec. 13, T. 33 N., R. 7 W., 3 miles northeast of French Gulch in the French Gulch mining district, consists of 40 acres. Elevation 2500 feet. Owner, V. Fox, of French Gulch. Strike of vein is northeast and southwest, dip N. 68° W., width 2 feet. Pay ore is found in pockets between slate walls. Workings consist of a tunnel 1000 feet long, 300 feet of drifts and 220 feet of incline shaft. Some rich ore found. Idle.

Bibl.: Reports, XII, p. 250; XIII, p. 360.

Jubilee, consists of 40 acres, in Sec. 23, T. 31 N., R. 6 W., ½ mile from Centerville. Owner, O. Westbrook, of Larkin. Five veins on claims, slate footwall and granitic-porphyry hanging. Pay shoot 100 feet long and 4 feet wide, free milling ore. Only slightly developed. One man working.

Kit Carson, consists of 100 acres, patented, in Sec. 3, T. 32 N., R. 5 W., 2½ miles southeast of Copley, in the Flat Creek mining district. Elevation 950 feet. Owners, Joshua Hendy Estate. Four parallel veins 3 feet wide, strike northeast and southwest, dip 50° E., granitic-porphyry footwall and slate hanging. Pay shoot 200 feet long and 3 feet wide, low grade. Workings consist of a 700-foot tunnel and 300 feet of drifts. Idle.

Laconia, in Sec. 1, T. 35 N., R. 6 W., 7 miles west of Delta and 1 mile east of Dog Creek Railroad, in the Dog Creek mining district, consists of 20 acres, in the Shasta Forest Reserve. Elevation 2000 feet. Three parallel veins, strike east and west, dip 40° S., meta-andesite footwall and quartz-porphyry hanging. Pay shoot 80 feet long and 3 feet wide. Short tunnels. Idle.

Liberty, consists of 240 acres, patented, in Secs. 31 and 36, T. 33 N., R. 5 and 6 W., 1½ miles northwest of Copley, in the Flat Creek mining district. Elevation 2000 feet. Owners, J. Chambers et al., of Redding. Three veins 2 feet wide, strike east and west, dip 65° N., quartz-porphyry walls. Pay shoot 220 feet long and 2 feet wide. Base ore.

Workings consist of a tunnel 1850 feet long, a 250-foot shaft and short drifts. Small producer at one time. One man employed.

Lodi, consists of 60 acres, in Sec. 16, T. 31 N., R. 6 W., about 3¼ miles north of Igo. Owners, W. D. Bull et al. Elevation 1400 feet. One vein 2 feet wide. Short ore shoot. Ore base below the surface, consisting of gold, silver, zinc and galena. Slightly developed with a short tunnel. Little ore shipped. Idle.

Bibl.: Reports, XII, p. 252; XIII, p. 361.

Lost Channel (drift) mine, consisting of 580 acres, is located in Secs. 3, 4 and 34, T. 30 and 31 N., R. 6 W., and extends southerly from the town of Igo for a distance of 1½ miles. Owner, C. A. Russell of Igo. The bedrock is soft, decomposed granite, slightly tilted. Course of channel is north and south, and contains some pay to a depth of 20 feet below the surface. Best values found 4 feet above bedrock. Workings consist of several tunnels, longest 1800 feet; also a number of old shafts 50 feet deep, all along Dry Creek. About 5 acres have been worked. Some of the gravel is rich. Gold is 875 fine, and sells for $18 per ounce. Leased by Porter & Thompson of Seattle, Wash., who endeavored to work the ground as a "dry land" proposition, using a shovel and then dumping the gravel into a rotary grinder, then running the tailings over a short copper plate. Experiment a failure. Power obtained from Northern California Power Company. Holdings now being drilled to determine dredging possibilities. Six men employed. Property has been a producer since 1865, when the first location (the Blue Bird) was made by T. White. Piety Hill drift mine to the northeast.

Mad Mule, formerly known as the *Banghart,* is located in Sec. 32, T. 33 N., R. 6 W., 5 miles northwest of Stella (by road), in the Shasta mining district. Holdings consist of 60 acres, located in 1887 and owned by the Mad Mule Mining Company of San Francisco; T. W. Briggs, superintendent. Two parallel veins exposed. Strike east and west, dip 30° N., slate footwall and meta-andesite hanging. Pay shoot 80 feet long and 16 inches wide. Four tunnels run on the veins, from 200 to 1000 feet in length. A tunnel is being run to obtain more depth on the ore body, four men being employed. Depth at present is about 250 feet. Surface sluiced off years ago and was rich. Best ore found near the footwall.

Bibl.: Reports IX, p. 38; XI, p. 396; XII, p. 252; XIII, p. 361; U. S. Geol. Surv., Bull. No. 540, pp. 40, 42, 52-54.

Mad Ox, consists of 80 acres in Sec. 32, T. 33 N., R. 6 W., 5 miles northwest of Stella. Owners, Caribou Gold Mining Company of Trinity Center. Elevation at tunnel 1800 feet. The vein has a

strike of N. 30° E., dip S. 80° E., andesite forms both walls. Pay shoot 100 feet long and 14 inches wide, free milling. Worked to a depth of 150 feet. Four short tunnels and one shaft on the vein. Worked but little since 1911.

Bibl.: Reports, XI, p. 397; XII, p. 252; XIII, p. 361; U. S. Geol. Surv., Bull No. 540, p. 51.

Maduro, consists of 60 acres, in Sec. 20, T. 32 N., R. 5 W., 1 mile south of Keswick. Owner, W. Shattuck. Elevation 800 feet. Four parallel veins, but little developed. Only enough work done to hold the claims. Prospect. Idle.

McCall, consisting of 60 acres in the Shasta Forest Reserve, is located in Sec. 32, T. 36 N., R. 5 W., 7 miles southwest of Delta, in the Dog Creek mining district. Elevation 1600 feet. Owners, A. J. Kirk et al. One vein 3 feet wide, strike N. 50° W., vertical dip, granodiorite footwall and slate hanging. Pay shoot 80′ long and 27 inches wide, free milling. Four tunnels, about 60 feet apart, from 50 to 1200 feet long, and 400 feet of drifts constitute the development work. Little high grade shipped.

McKinnon, consists of 60 acres, in Sec. 6, T. 35 N., R. 5 W., 7½ miles west of Delta, and 1½ miles east of Dog Creek Railroad in the Dog Creek mining district, and in the Shasta Forest Reserve. Owner, A. McKinnon. One vein exposed, strike east and west, dip 70° N., 2 feet wide, granodiorite walls. Pay shoot 160 feet long and 2 feet wide, free milling. Three tunnels on the vein from 60′ to 750′ in length. Two men employed.

Midas, quartz mine, consisting of 550 acres, is one of the famous gold producers of Shasta County. It is located in Secs. 3, 4, and 10, T. 29 N., R. 10 W., some 52 miles southwest of Redding, by road, and in the Harrison Gulch mining district. The Victor Power and Mining Company has recently acquired this property. President, J. H. Sharp; secretary, P. H. Coffman; superintendent, A. L. Fletcher. Home office, Red Bluff. There are three known veins on the group—Gold Hill, Baldwin and Middle—strike N. 48° W., dip 75° S., average width 14 inches. There is considerable faulting, largest fault over 400 feet in width. The ore occurs in lenticular form, the pay shoots varying in length from 200 to 400 feet, width 14 inches, free milling. The Baldwin vein has been extensively worked. The development work consists of two double compartment shafts (6′ x 12′), one being 1400 feet deep, 14 levels, 26,000 feet of drifts, 11,000 feet of crosscuts, raises, stopes from 50′ to 300′ long, and tunnels from 50′ to 900′ in length. Stripping and filling method of mining used. Timber obtained from company's holdings and worked in sawmill some three miles from the mine. The mine equipment consists of two steam hoists and all

necessary equipment such as cars, shops, tools and dwellings. Steam power used for hoisting throughout the year, while mill, pumps and compressor run on steam for seven months, balance of year by water power. The reduction equipment consists of a 20-stamp mill, 1000-pound stamps, six Frue concentrators and a new 100-ton cyanide plant, fine grinding with tube mill. Several thousand tons of tailings have been impounded ready for treatment. Company also owns 1200 acres of timber land. Number of men employed—top 25, mine 98, mill 4, total 127. Production for 1912—tons, daily 53, monthly 1597, for year 19,166. Percentage of extraction 76.83. Cost per ton 1912, development $1.86, mining $5.64, milling $0.58, general $1.07, total $9.15. The mine has been in active operation for the past twenty years and has produced several million dollars in gold. Victor mine to the east.

Milkmaid and Franklin, also known as the *Western,* has been a gold producer for many years, being one of the early discoveries in the French Gulch district. It is owned by the Western Exploitation Company, H. F. Musser, manager, and comprises 120 acres, consisting of the Milkmaid and Franklin groups, situated in Sec. 17, T. 33 N., R. 7 W., 3 miles by wagon road from the town of French Gulch. Elevation 1700 feet. Of the country rock, slate and granitic-porphyry form the hanging and footwall respectively. Two veins have been followed in the Franklin workings, one with a N. 5°–30° W. strike and a dip of 75° E., the other strikes W. The intersection of the two veins has not been discovered. The vein with the northward strike is in the western part of the workings and has been stoped for 70 feet on the main level. The other vein has been followed for 700 feet on the main level. The maximum width is 4½ feet, average 16 inches, but narrows down to a seam in places. The ore consists of ribbon quartz, carrying pyrites, and is free milling. The workings on the Franklin consist of a main adit about 1300 feet long, and two shorter levels, connected by a raise on the vein and a 130-foot winze connecting the main level with the old level, also drifts and stopes, totaling several hundred feet of development work. Stopes as a rule are filled with waste.

The Milkmaid, which adjoins the Franklin on the east, has not been worked recently, but has been a producer in the past. One vein has a strike of N. 30° E., dip vertical, and has been developed with tunnels, drifts and stopes, also a 400-foot incline shaft sunk at an angle of 45°. Ore was rich and free, but the vein was small. The mine equipment consists of cars, tools, shop and dwellings. The reduction equipment consists of a new 10-stamp mill on the Milkmaid group. The operating power, electricity, is obtained from the Northern California Power Company. The stamps weigh 1100 pounds each, and

drop at the rate of 102 times per minute for a distance of 6 inches, the ore being crushed through a 40-mesh screen and thence conveyed to four Frue vanners. Fourteen men employed. Considerable ore extracted by lessees in former years. Production in last five years about $350,000. Property adjoins the old Washington mine.

Bibl.; U. S. Geo. Surv., Bull. No. 540, pp. 35, 61, 63, 64.

Minnesota, in Secs. 1 and 2, T. 32 N., R. 6 W., 2 miles southwest of Copley, in the Flat Creek mining district, consists of 100 acres, patented. Owner, J. W. Parmalee. Five veins on the claims, four parallel, diorite footwall and granitic-porphyry hanging. Work confined to one vein having a strike of N. 40° E., dip 35° N. Pay shoot 150 feet long and 4 feet wide, free milling. Workings consist of a tunnel 1900 feet long, 1000 feet of drifts, raises, and a stope 150 feet long. Old 10-stamp mill idle. Producer at one time. Two men employed.

Mount Pleasant consists of 80 acres, in Sec. 32, T. 32 N., R. 5 W., 1 mile west of Redding, in the Shasta mining district. Owners, H. C. Cummings et al. Elevation 900 feet. Vein has a northwest and southeast strike and dips 45° E., slate footwall and quartz-porphyry hanging. Pay shoot 140 feet long and 3 feet wide, free milling. Workings consist of a tunnel 500 feet long and short drifts. One man employed.

Mount Shasta, one of the quartz producers of this county, is located in Sec. 33, T. 32 N., R. 6 W., about 3 miles south of the town of Stella. Owner, Mount Shasta Mining Company, of San Francisco; G. M. Vail, superintendent. The holdings consist of 120 acres, which were acquired from George Leversay, by the Mount Shasta Gold Mines Corporation. This corporation failed in 1905 and the mine was idle until 1911, when it was secured by the present owners. Elevation 2200 feet. There are two parallel veins on this group about 50 feet apart, strike N. 40° W., dip 40°–50° S., quartz-diorite footwall and granitic porphyry hanging. Pay shoot 400 feet long and 12 feet wide, low grade, free milling. Development work consists of a shaft 465 feet deep, seven levels, 300-foot drift on the seventh level, several stopes and short tunnels. Mine equipment consists of cage, wooden gallows frame, steam hoist, dwelling, etc. The 8-stamp mill, steam driven, is idle. Stamps weigh 1050 pounds each. Some ore blocked out. Four men working.

Bibl.: U. S. Geol. Surv., Bull. No. 540, pp. 39, 44, 46, 47–48.

Morton & Bliss, formerly known as the *Riley & Bliss,* consists of 100 acres, patented, in Sec. 1, T. 33 N., R. 6 W., 6½ miles west of Kennett, in the Backbone mining district. Owner, Bliss Estate, of New York. Elevation 2600 feet. Two parallel veins 3 feet wide, strike

northeast and southwest, dip 40° E. Pay shoot 200 feet long and 3 feet wide, free milling. Workings consist of two tunnels on the vein 380 to 2400 feet long, 500-foot drift, raise and stope 200 feet long. Old 10-stamp mill idle. Stamps weigh 850 pounds each. Mill can be operated both with steam and water power, water from South Fork of Squaw Creek. Property has been a producer, but idle at present.

Murray consists of 120 acres, in Sec. 18, T. 32 N., R. 5 W., 1½ miles north of Keswick. Elevation 1000 feet. Owners, Mount Shasta Mining Company. H. C. Cummings, of Redding, manager. Vein about 6 feet wide, strike N. 40° E., dip 50° S. Pay shoot about 230 feet long, 6 feet wide, quartz-porphyry footwall and syenite hanging. Ore free milling but low grade. Developed by means of a tunnel 530 feet long, 200-foot drift and one short raise. Four men working. Small producer at one time.

Bibl.: Reports XII, p. 243; XIII, p. 362.

Nellie and *Annie,* consists of 80 acres in Secs. 1 and 2, T. 33 N., R. 7 W., 5 miles north of French Gulch, in the French Gulch mining district. Elevation 3200 feet. Owners, M. Welch et al., of French Gulch. The vein has an east and west strike and dips 60° S., slate footwall and granite-porphyry hanging. Pay shoot 230 feet long and 2 feet wide, ore free milling. A tunnel 340 feet long, and short drifts constitute the development work. A little production by lessees.

New York and *Skylark,* consisting of 60 acres, is located in Sec. 17, T. 33 N., R. 7 W., 4 miles northwest of French Gulch, in the French Gulch mining district. Elevation 2800 feet. Owner, W. Richards. Two parallel veins about 200 feet apart strike east and west, dip 60° N., slate walls. Ore shoot 180 feet long and 5 feet wide, low grade, free milling. Workings consist of a tunnel on the vein 340 feet long, a 40-foot winze and 1 stope. Production record small. Idle.

Niagara, formerly known as *Black Tom,* was at one time one of the famous quartz producers of the French Gulch mining district, but has been idle since 1905. This group, consisting of 410 acres, patented, is located in Secs. 1, 6, 7, 8, 15 and 18, T. 33 N., R. 7 W., about 4½ miles by road from French Gulch. Elevation 2800 feet. It is on the same hill as the Washington mine, and the claims were located in 1857. Owners, W. W. Bunzoine et al., of French Gulch. The vein system is not well defined. The main veins, two in number, one on the Niagara, and the other on the Scorpion claims, have been worked. The strike is northeast and southwest, dip N. 70° W., footwall is granitic-porphyry and hanging-wall is slate. The ore is free-milling with some pyrites. Ore shoot 200 feet long and 3 feet wide. Workings consist of six tunnels, four being crosscuts from 150 to 2200 feet in length, 2000 feet of drifts, several stopes and raises. Tunnel on Niagara claim is 1662

feet long. The reduction equipment consists of four old stamp mills, 18 stamps in all, steam driven. Mine said to have produced over $1,000,000 in gold. Maximum depth about 500 feet. Said to be on the same lead as the Washington mine.

Bibl.: Reports X, p. 636; XI, p. 50; XII, p. 253; XIII, p. 263. U. S. Geol. Surv., Bull. No. 540, pp. 35, 37, 44, 67.

North Star consists of 60 acres, in Sec. 18, T. 31 N., R. 6 W., 4 miles northwest of Igo, at an elevation of 1600 feet. Owner, J. W. George. One vein in syenite and slate, but slightly developed, short ore shoot, little high grade extracted. Idle. Prospect. Mentioned in our Report XIII.

Bibl.: Report XII, p. 253.

Old Spanish, formerly known as *Deakin & Taylor,* and as *Enright,* is located in Sec. 31, T. 32 N., R. 5 W., 2 miles west of Redding. Owner, J. Sallee. Holdings consist of 60 acres, at an elevation of 800 feet. Vein 5 feet wide, strike north and south, dip 45° E., slate walls. Pay shoot 140 feet long and 5 feet wide, low grade, free milling. Workings consist of a 460-foot tunnel, 600 feet of drifts and 1 stope. Old 4-stamp mill. Idle. Property a producer at one time.

Bibl.: Report XII, p. 246.

Olive, consisting of 80 acres, is located in Sec. 19, T. 32 N., R. 5 W., 1½ miles southwest of Keswick. Elevation 1100 feet. Owner, Wright Estate. Three parallel veins, granite footwall and schist hanging. Pay shoot 230 feet long and 6 feet wide, low grade, free milling. Old 4-stamp mill idle. Small producer several years ago.

Oro Fino consists of 60 acres in Sec. 34, T. 32 N., R. 6 W., ½ mile east of old town of Shasta. Elevation 1200 feet. Owner, C. H. Berhrens. Two parallel veins, quartzite footwall and hornblende hanging, east and west strike, and a dip of 60° S. Pay shoot 200 feet long and 2 feet wide, ore free milling. Only slightly developed by means of three tunnels on vein, longest 700 feet. One man working.

Bibl.: Report XI, p. 44.

Oro Vista, in Sec. 36, T. 32 N., R. 6 W., ½ mile southeast of old town of Shasta, consists of 60 acres. Elevation 1600 feet. Owner, N. D. Fowler. Three parallel veins, strike east and west, dip 85° N. Pay shoot 170 feet long and 4 feet wide, low grade, free milling. Workings consist of a tunnel 530 feet long, and short drift. Two men employed.

Potosi consists of 60 acres, patented, in Sec. 15, T. 31 N., R. 6 W., 1½ miles northwest of Centerville, in the Igo mining district. Elevation 1000 feet. Owner, E. P. Jones. One vein, slate footwall and

granitic-porphyry hanging. Pay shoot 100 feet long and 1 foot wide; some high grade extracted. Short tunnel and 90-foot shaft comprise the workings. Idle.

Bibl.: Reports XII, p. 254; XIII, p. 363.

Princess (drift and hydraulic) mine consists of 300 acres, patented, in Secs. 25 and 26, T. 31 N., R. 6 W., 1 mile south of Centerville. Owner, I. Baer. Course of channel is northeast and southwest, granite bedrock; depth of gravel, 30 feet. About 40 acres worked. Workings consist of an old tunnel on bedrock 600 feet long, drifts and old shafts 50 feet deep. Water supply was obtained from Boulder Creek through a ditch 12 miles long. Owner had a permit from the debris commission, granted in 1901, to operate, but the retaining dam was condemned and the property has been idle since that time. Chapman & Voluntine hydraulic mine to the northeast.

Red Hill (drift and hydraulic) mine, formerly known as *Gardner Bros.*, consists of 60 acres, in Sec. 1, T. 30 N., R. 7 W., ½ mile northeast of town of Ono. Owners, M. Gardner et al., of Ono. Course of channel northeast and southwest; soft granite bedrock, gravel 20 feet deep. Water obtained from Eagle Creek through a ditch 2 miles long. Formerly worked as a hydraulic mine, but on account of the debris law it is operated by drifting. In operation during the winter months. Small producer.

Bibl.: Reports XII, p. 255; XIII, p. 363.

Reid, in Sec. 3, T. 32 N., R. 5 W., 2 miles southeast of Copley, in the Flat Creek mining district, consists of 140 acres. Owner, J. M. Selnave. Elevation 1900 feet. Three parallel veins, strike N. 40° E., dip 35° E. Pay shoot 200′ long and 2′ wide, free milling. Bonded to Geo. Bayha. Two men working.

Ruby and Pearl consists of 100 acres, in the Shasta Forest Reserve, in Sec. 4, T. 38 N., R. 5 W., 6 miles north of Castella. Owner, J. Wall. Elevation 5500 feet. One vein, strike northwest and southeast, dip 40° E., granite walls. Pay shoot 80 feet long and 1 foot wide, ore free milling. Developed by means of one tunnel 400 feet long on vein, and short drifts. Bryan mill, capacity 5 tons daily. Idle. Small producer.

Sam Houston, in Sec. 34, T. 33 N., R. 5 W., about 2 miles east of Copley, in the Flat Creek mining district, consists of 80 acres. Elevation 1000 feet. Owners, Sam Houston Mining Company of San Francisco. Three veins, quartz-porphyry walls. Pay shoot short, similar to the Garfield prospect. A little ore in sight. Idle.

Scottish Chief consists of 120 acres, patented, in Sec. 31, T. 33 N., R. 5 W., ½ mile northwest of Copley, in the Flat Creek mining district.

Elevation 900 feet. Owner, W. Menzel. One vein 2 feet wide, strike northwest and southeast, dip 75° E., granite walls. Pay shoot 80 feet long and 2 feet wide, free milling ore. Workings consist of a tunnel on vein 800 feet long, drift and stope. Old 3-foot Huntington mill. Idle. Small producer at one time, but the property has not been worked recently.

Shasta Dredging Company, operating on the old Quinn ranch, owns 400 acres of land along Clear Creek, in Secs. 31 and 32, T. 31 N., R. 5 W., about 4 miles southwest of Redding, in the old Horsetown district. This property was operated for a time by the California and Detroit Mining Company, but their suction dredge proved a failure and the present owners acquired the holdings in 1902. A. S. Newsome, president; W. A. Palmer, manager; and J. Heaton, superintendent of dredge for the company. Home office, San Francisco. The course of the channel is east and west, slate and sandstone bedrock tilted. Pay gravel about 20 feet deep. About 100 acres have been worked. Dredge equipped with 5-cubic foot buckets and 6′ x 30′ screens. Power from Northern California Power Company. Boat handles about 60,000 cubic yards per month. Twelve men employed. Three new hulls have been built by present company. Ground worked in the early days with rockers and was rich.

Bibl.: Bull. No. 57, p. 216.

Silver Falls, formerly known as *South Fork,* consists of 240 acres, in Sec. 20, T. 31 N., R. 6 W., 2 miles northwest of Igo. Owners, Silver Falls Mining Company, of Redding; H. Rogers, president. Eight veins on the claims, granite walls. Workings consist of 600-foot tunnel and drifts. Two men working. Small producer. Atlantic to northeast.

Siskiyou and Nightingale consists of 40 acres in the Shasta Forest Reserve, in Sec. 2, T. 35 N., R. 6 W., 7 miles west of Dog Creek Railroad, in the Dog Creek mining district. Elevation 2200 feet. Owners, Glenn County Mining Company; home office, Millsaps; Geo. Millsaps, president; A. Luce, secretary. Five veins on the claims. Strike of main vein east and west, dip vertical, slate footwall and andesite hanging. Pay shoot 450 feet long and 3 feet wide, free milling. Workings consist of five tunnels on vein from 100 to 500 feet long and four drifts. Two men employed. Active development work to be pursued. Delta Consolidated to north and Trinity Consolidated to south.

Slattery & Welch (hydraulic) mine consists of 30 acres, in Sec. 8, T. 33 N., R. 6 W., about 5 miles northeast of French Gulch, in the French Gulch mining district. Owners, Slattery & Welch, P. J. Slattery, superintendent. Course of channel northeast and southwest. Pay gravel from 5 to 10 feet deep. Water obtained from Clear Creek and

Klines Gulch through a ditch 3 miles long. Only worked for a short time during the winter season. Some coarse gold found. Small producer.

Slide consists of 100 acres, patented, in Secs. 7 and 8, T. 32 N., R. 5 W., 1 mile north of Keswick. Owner, J. McCreary. Pay shoot 110 feet long and 2 feet wide, free milling, granitic-porphyry walls. Workings consist of a tunnel on vein 700 feet long and 600 feet of drifts. Two men working. Prospect.

Summit and Montezuma, midway between the Brunswick and Niagara mines, is located in Sec. 17, T. 33 N., R. 7 W., 5 miles west of French Gulch, in the French Gulch mining district. Elevation 4200 feet. Holdings consist of 60 acres, patented, under lease to Allen & Alexson. Property owned by Porter & Wheeler Estate, of Redding. Two parallel veins on this group, strike northeast and southwest, dip 70° N. Ore shoots are short and 8 inches wide, free milling, some high grade found, a 3-ton lot giving returns of $423 per ton in gold. Workings consist of three adits about 40 feet apart, 200-foot drift and a stope 40 feet long. The lessees have the ore milled at the Washington mill.

Bibl.: Report X, p. 641; U. S. Geol. Surv., Bull No. 540, pp. 35, 37, 44, 67.

Sunday Gulch, a recent location, consists of 300 acres, in Sec. 10, T. 29 N., R. 10 W., 3 miles southeast of Harrison Gulch. Owners, Victor Mining Company; J. H. Sharp, president; A. L. Fletcher, superintendent. Four parallel veins, strike N. 70° E., dip 45° S., main vein is 4 feet wide and gave returns in places, on the surface, of $8 per ton in gold, slate footwall and diabase hanging. Prospect, just being developed by means of short tunnels. Two men employed.

Sunny Hill, formerly known as *Summit* and *Gray Eagle,* consists of 100 acres in Sec. 1, T. 30 N., R. 8 W., about 7 miles west of Ono, in the Ono mining district. Owner, M. Mariscano, of San Francisco. One vein 1 foot wide, strike north and south, dip vertical, hornblende schist footwall and granitic-porphyry hanging. Pay shoot 80 to 100 feet long, ore free milling. Workings consist of tunnel 530 feet long, 300 feet of drifts and one stope. Elevation at tunnel 4500 feet. Reduction equipment consists of two 5-foot Huntington mills run by water power; water from Jerusalem Creek. Producer at one time; some high grade ore found. Two men employed.

Bibl.: Reports XII, p. 257; XIII, p. 365.

Tanglefoot, consists of 60 acres in Sec. 12, T. 30 N., R. 8 W., about 8 miles southwest of Ono. Owner, W. M. Lee. Two parallel veins about 200 feet apart, strike N. 40° W., dip 50° E. Pay shoot 60 feet

long and 10 inches wide; free milling; some high grade ore extracted. Only slightly developed with a tunnel 450 feet long. Idle.

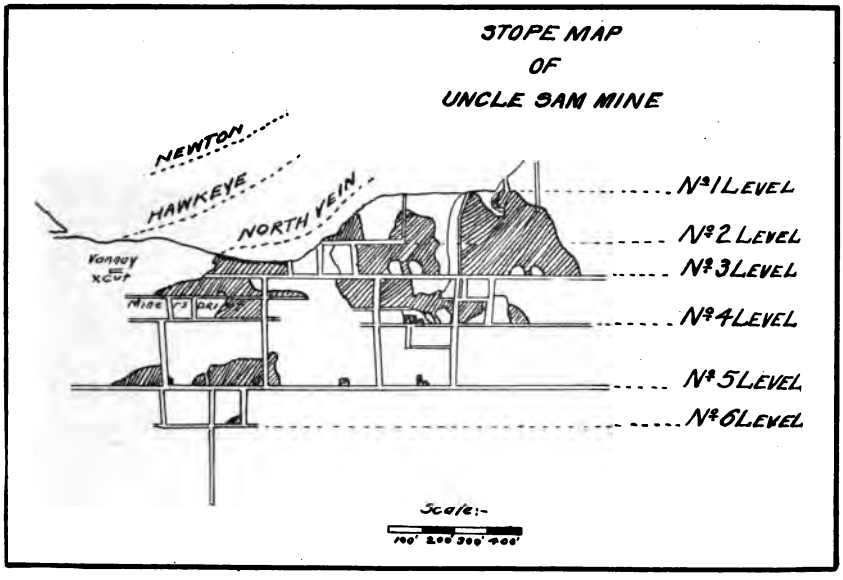
Texas Consolidated, one of the old gold producers of Shasta County, is located in Secs. 32 and 33, T. 33 N., R. 5 W., about 1 mile east of Copley, in the Flat Creek mining district. The holdings consist of 220 acres, patented; elevation 1800 feet. Owned by the Texas Consolidated Mining Company, C. E. Jarvis, president. Home office, Cleveland, Ohio. There are four known veins on this group. The main vein has a N. 50° E. strike and dips 70° E., width 4 feet, quartz-porphyry walls. Pay shoot 340 feet long and 4 feet wide, ore free milling. The development work consists of a tunnel on the main vein 4000 feet long, several thousand feet of drifts, raises and stopes. The mine equipment consists of all necessary machinery, shop and dwellings. The reduction equipment consists of a 20-stamp mill, driven by electricity; eight Triumph concentrators, and an old 3-ton chlorination plant, all idle. Power obtained from Northern California Power Company. Mine under lease to Geo. Bayha. Four men employed. Some ore in sight.

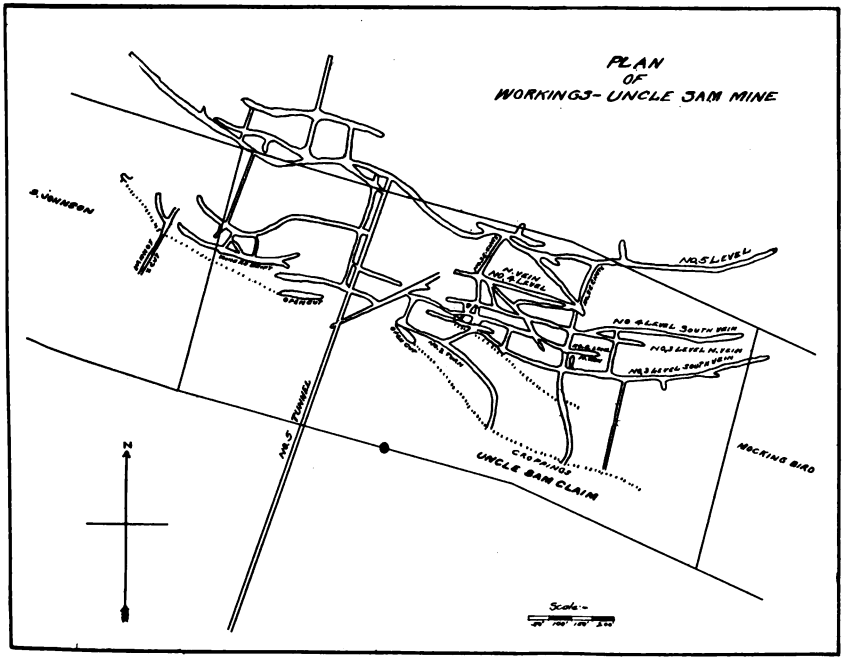
Bibl.: Reports X, pp. 629, 630; XI, pp. 43, 395-397; XII. p. 258; XIII, p. 365.

Three Sisters, consisting of 60 acres, patented, located in Sec. 15, T. 33 N., R. 7 W., 2 miles northwest of French Gulch, in the French Gulch mining district, elevation 1700 feet. Owned by Ellery et al., of French Gulch. Three veins on the claims carrying rich ore in spots. One pay shoot is 200 feet long and 18 inches wide, between granitic-porphyry walls. Workings consist of a tunnel 1350 feet long on the vein, 800 feet of drifts, a stope 200 feet long and a winze 120 feet deep; ore free milling. The 3½-foot Huntington mill, steam driven, is idle. Property has been a producer, but has been worked in only a small way since 1905.

Bibl.: Report XIII, p. 367; U. S. Geol. Surv., Bull. No. 540, p. 69.

Tom Green, adjoining the Brunswick mine on the west, is located in Sec. 15, T. 33 N., R. 7 W., 5½ miles west of French Gulch, in the French Gulch mining district. The holdings, consisting of 80 acres, located in 1887, elevation 4400 feet, are owned by J. E. Francks et al., of French Gulch; leased to W. P. Hight. Three parallel veins, but only one has been worked, strike north and south, dip 45° E., granitic-porphyry footwall and slate hanging. Ore shoot 210 feet long and 2 feet wide; ore is free milling. Workings consist of a tunnel on the vein 1900 feet long, drifts, stopes and a raise 80 feet in height. Old 10-stamp mill, steam driven, is idle. Worked by lessees since 1906. Three men employed. Small producer.


STOPE MAP
OF
UNCLE SAM MINE
NEWTON
HAWKEYE
NORTH VEIN
Vanoy
XCut
Raise
No 1 Level
No 2 Level
No 3 Level
No 4 Level
No 5 Level
No 6 Level
Scale:-
100' 200' 300' 400'


PLAN
OF
WORKINGS- UNCLE SAM MINE
B. JOHNSON
No 5 Level
No 4 Level South Vein
No 3 Level N. Vein
No 3 Level South Vein
No 5 Tunnel
Crosscuts
UNCLE SAM CLAIM
MOCKING BIRD
N
Scale:-

Trinity Consolidated, consisting of 120 acres, patented, elevation 2400 feet, is located in Secs. 1 and 2, T. 35 N., R. 6 W., west of Delta, and 1½ miles west of D. C. R. R., in the Shasta Forest Reserve. Owner, Alden Anderson of Sacramento. Eight veins on the group, six being parallel, strike of parallel veins east and west, dip vertical, slate footwall and meta-andesite hanging, width 3 feet. Pay shoot 450 feet long and 3 feet wide, free milling ore. Workings consist of several tunnels on the vein from 50 to 450 feet long, drifts, raises and stopes. Maximum depth 160 feet. Reduction equipment consists of a 10-stamp Hendy mill, built in 1900; stamps weigh 1100 pounds. Mill operated by both steam and water power, water being obtained from Dog Creek through a ditch 1 mile long. Property has been a small producer. It is on the same lode as the Delta Consolidated. Advance group to the north and Siskiyou to the northeast. Idle at present.

Bibl.: Reports XIII, p. 367; U. S. Geol. Surv., Bull. No. 540, pp. 35, 37, 54, 55.

Truscott, formerly known as the *Emigrant,* consists of 40 acres in Sec. 25, T. 32 N., R. 7 W., about 6 miles northwest of Stella. Owner, John Martin, of San Francisco. Elevation at main tunnel 2600 feet. Two veins on the claims; the main vein has a strike of N. 20° E., dip 70° W.; the other vein is small and crosses the main vein at a slight angle, slate footwall and andesite-porphyry hanging. Pay shoot 100 feet long and from 5 to 10 feet wide, free milling, low grade. Development work consists of four tunnels 40 feet apart on the vein, from 50 to 610 feet in length, drifts and stopes. Property has been a producer. Two men working.

Bibl.: Report XII, p. 248.

Uncle Sam, one of the noted quartz mines of this county, is located in Sec. 1, T. 33 N., R. 6 W., 6 miles west of Kennett, in the Backbone mining district. Elevation 2300 feet. Present owners are the Dakin Company, of San Francisco, who control 140 acres of patented mineral ground. The mine was discovered in 1886 by J. Conant, who sold it to Dakin and his associates, and after working the property for a time it was acquired by the Sierra Buttes Mining Company. This company operated the mine for several years, producing over $1,000,000 in gold, from a maximum depth of 450 feet. A wagon road connects Kennett, a town on the Oregon Branch of the Southern Pacific Railroad, with the mine. Several veins, only one of which has been worked, strike N. 80° W., dip 55° NE., width 4 feet. Lode can be traced on the surface for 2000 feet. Ore is free milling. The development work consists of five tunnels, four on the vein, from 50 to 3000 feet long, one crosscut 400 feet long, drifts, raises and stopes (see map). The mine

equipment is complete; compressor plant destroyed by fire in 1913. The reduction plant consists of a 20-stamp mill, four Frue vanners, old canvas and chlorination plants. Mill operated by electricity from Northern California Power Company. Stamps weigh 850 pounds each. Property operated for a time by a Portland company on a lease. Idle since May, 1913. Some ore blocked out. New ore shoot recently discovered.

Bibl.: Reports X, p. 639; XI, pp. 47, 395, 398; XII, p. 258; XIII, p. 367.

Utah and California, also known as the *Walker,* is located in Secs. 3 and 4, T. 32 N., R. 5 W., 2 miles southeast of Copley, in the Flat Creek mining district. Holdings consist of 270 acres, elevation 800 feet. Owned by Walker Bros., of Salt Lake City, Utah. Five veins on the group. Main vein has a north and south strike and dips 80° E., quartz porphyry walls. Pay shoot 300 feet long and 5 feet wide, low grade, free milling. Workings consist of a tunnel 2300 feet long on the vein, several thousand feet of drifts and stopes. Reduction equipment consists of 10-stamp mill and four Frue vanners, steam driven. Stamps weigh 1000 pounds each. Producer at one time. Idle.

Bibl.: Reports X, pp. 630-631; XII, p. 259; XIII, p. 368.

The Victor, adjoining the Midas mine on the east, consists of 250 acres, in Sec. 3, T. 29 N., R. 10 W., in the town of Harrison Gulch, in the Harrison Gulch mining district. Elevation at mine shaft 2600 feet. Owners are the Victor Power and Mining Company, J. H. Sharp, president; P. H. Coffman, secretary; A. L. Fletcher, superintendent; R. D. Jackson, consulting mining engineer. Home office, Red Bluff. Two veins on the group, known as the Baldwin and Gold Hill, strike N. 50° W., dip 75° SW., diabase walls, average width of veins 2 feet. Pay shoot 300 feet long and 2 feet wide. Ore free milling. Several faults, one being 400 feet wide. The development work consists of a shaft (4′ x 9′) which is 400 feet deep, five levels, 800 feet of drifts, 960-foot crosscut, raises and one stope 300 feet long. Shaft sunk on a 45° incline. The mine equipment consists of three distillate engines (15, 32 and 50 h.p.), hoist, 50-foot gallows frame, compressor, pumps, shop, dwellings. Reduction equipment consists of a 3-stamp Nissen mill and two Frue concentrators. Stamps weigh 1300 pounds each. Plant operated with distillate, costing 19¢ per gallon; use 100 gallons per day. Seven men employed. Property a small producer at present. The wagon road from Redding to Harrison Gulch passes through the Victor claim. Workings confined mainly to the Victor claim.

Washington, located in 1852, was the first quartz location in Shasta County and is one of the oldest mines in California. At one time it was the largest producer in the French Gulch mining district. The holdings consist of 82 acres in Secs. 16 and 17, T. 33 N., R. 7 W., 3 miles northwest of French Gulch. Elevation 2300 feet. Owners, Washington Gold Mining Company, of Redding: C. L. Watson, manager. Leased to Maxwell & Ketch. Two veins about 60 feet apart have been worked; one has a north and south strike, with a dip of 70° E. and has been worked only near the surface; the other has an east and west strike, with a north dip, and has been worked to a depth of 500 feet. The north and south vein seems to cut off the other. The east and west lead pinches in places and at times widens to 10 feet, being in a well-defined fault plane. The footwall is granitic porphyry and the hanging slate; ore is free milling. The workings consist of six tunnels from 300 to 2400 feet long, drifts, raises and stopes, comprising in all several thousand feet. The main tunnel caved in many places. One stope is said to be 400 feet long, 5 feet wide and 250 feet high. The reduction equipment consists of an old 10-stamp mill and two vanners; stamps weigh 850 pounds each. Custom ore treated in this mill. Mine said to have produced over $2,000,000. The first mining operations consisted in sluicing the rich and decomposed material on the outcrop. Some of the oxidized ore was rich, running at times over $600 per ton in free gold. Three men employed by the lessees. Milkmaid to the south.

Bibl.: Reports X, pp. 635-636; XI, p. 50; XII, p. 260; XIII, p. 368; U. S. Geol. Surv., Bull. No. 540, pp. 35, 37, 44, 64-66.

GRANITE.

The granite in Shasta County is generally of a light color, containing some hornblende and shows the effect of strong pressure, as the rock, when not decomposed, is much jointed and cross-jointed. It is not much used for building or monument purposes on account of fracture planes and quartz seams cutting through the rock.

Bibl.: Bull. No. 38, p. 53.

Masterton Quarry, consisting of 60 acres, is located in Sec. 20, T. 32 N., R. 6 W., about 1½ miles south of Stella. This deposit is very massive. Only the boulders are worked. Used for curbing and coping. Idle at present.

Jewel Quarry is located in Sec. 25, T. 31 N., R. 6 W., 2½ miles east of Igo. Massive deposit. Rock grayish in color and similar to Masterton deposit. It has not been worked for several years.

INFUSORIAL EARTH.

Several exposures of infusorial earth, locally called "chalk," are found in the northeastern part of this county, but more especially along both banks of the Pitt River, near the mouth of Hat Creek, and up that creek for about 5 miles. Only a relatively small part of these beds is pure, the greater portion being mixed with sand. The beds are seldom over 10 feet thick and are interbedded with tuffs and basaltic debris. These exposures are especially prominent in Secs. 7, 17 and 18, T. 36 N., R. 4 E., M. D. M.

Bibl.: Bull. No. 38, pp. 296, 363.

IRON ORE.

The most prominent deposits of iron ore are found in close proximity to the McCloud Carboniferous limestones on both sides of the Pitt River. There are also extensive surface indications of iron ore bodies, north of Pitt and east of McCloud rivers.

Bibl.: Reports II, p. 195; IV, pp. 236, 259; Bull. No. 38, pp. 301–304. J. S. Diller, U. S. Geol. Surv., Bull. 213, pp. 130, 219, and Bull. No. 225, p. 178.

Noble Electric Steel Company, formerly known as *Shasta Iron Company,* owns 320 acres in Sec. 25, T. 34 N., R. 3 W., M. D. M., about 5 miles east of Pitt. The Sacramento Valley and Eastern Railroad connecting Pitt, a station on the Oregon branch of the Southern Pacific Railroad, with the Bully Hill mine, passes through a portion of these holdings. John Crawford is superintendent for the Noble Electric Steel Company; home office, San Francisco. The iron ore lies between quartz-diorite and limestone (McCloud). The deposit is large and massive, consisting of iron oxide and magnetite, and is worked as a quarry, the ore being shot down and conveyed to the smelter a distance of ½ mile by means of an automatic tramway.

The method of treatment consists in retorting the ore in an electric smelter, using charcoal and carbon, electrically heated, thus igniting the charcoal, which is used as a means of reducing the ore. The carbons, two in number, are 6 feet long and 6 inches in diameter. No stack on the retort, as draft is obtained by means of blowers. A proper charge (charcoal, barren quartz and limestone fluxes) is charged simultaneously with the ore, so the whole is well mixed by the time it reaches the smelting zone. Tap furnaces three times and run the ore into sand pig beds. When it has cooled down so that it will not "bleed," the sow with its attendant pigs is lifted from each bed by grab-hooks and carried on a traveling crane. The iron is broken up by a drop, lifted by a magnet and transferred to the platform scales, where it is weighed. From here it is stacked according to grade, grading altogether by silicon

content, as sulphur and phosphorus are very low. Grades run from No. 1 silicon, containing 4.5%–5% silicon, to foundry low with 1%–1.25% silicon. The iron is tougher, finer grained, and has a more homogeneous fracture than other charcoal irons. Daily production about 25 tons.

The furnaces are long and narrow, consisting of rectangular shell 25′ long, 10′ wide and 8′ high, battered four ways at the bottom to form a crucible. The portion above the bottom corresponds to the back or smelting zone of the blast furnace. The shell, lined with standard furnace brick, supports five charging stacks 18 feet high, and between these are suspended four electrodes which penetrate vertically into the charge. Electricity obtained from Northern California Power Company. Twelve men employed at present. Lime is also manufactured.

LIMESTONE.

Three parallel belts of limestone, having a general north and south strike, occur in the western half of this county. The most eastern belt is found on Cedar Creek, east of the Afterthought mine in the southern portion of T. 34 N., R. 1 and 2 W., and in Secs. 7 and 8, T. 34 N., R. 2 W., the furance flux for the Bully Hill mine coming from the latter sections. Another belt is found in Sec. 26, T. 33 N., R. 4 W., and can be traced for many miles, forming the McCloud bluffs, near the United States Fisheries. The most western belt crops out east of the Sacramento River in the northern part of the county, and is again found west of Kennett, on the south side of the divide between the two Backbone creeks. This deposit has been more extensively worked than any of the others, and is of good quality.

Bibl.: Diller, U. S. Geol. Surv., Bull. No. 196, p. 94; Bull. No. 213, p. 365; Bull. No. 225, p. 176. State Mining Bureau Bull. No. 38, pp. 88–91, 366; Vol. I of Paleontology of California, Whitney; Report XI, pp. 35-40.

Holt & Gregg Quarry is located in Sec. 32, T. 34 N., R. 5 W., and consists of 120 acres, patented, about 2 miles northwest of Kennett, on the south slope toward Little Backbone Creek, at an elevation of 2000 feet. This excellent limestone deposit, on the western belt, is owned by Holt & Gregg, of Redding; F. M. Kindelberger, superintendent. Quarrying method of mining used. The limestone is hauled to the kilns at Kennett, a distance of 2 miles, by means of an electric railway, power being obtained from the Northern California Power Company (see photo No. 7). The crude material is roasted in three Hoffman continuous kilns, crude oil being used for fuel. Lime removed every two hours. Output is 25 tons in twenty-four hours. Product is of an excellent grade and sold extensively throughout California. Thirteen men employed.

MACADAM.

The macadam used for the streets of Redding comes from the *Redding Municipal Quarry,* located in Sec. 29, T. 32 N., R. 5 W., 1 mile northwest of this city. The holdings consist of 30 acres, patented. The quarry work is under the direction of the superintendent of streets. The rock is altered, siliceous in character, and igneous in origin. The

Photo No. 7. Holt & Gregg Lime Plant, Kennett.

deposit is massive and easily worked. The equipment consists of a 300-ton ore bin, a rotary crusher of 250 tons capacity, air compressor, four machine drills, ½ mile of narrow gauge track and ore cars, all operated by electric power from Northern California Power Company. Only worked upon demand.

Bibl.: Bull. No. 38, p. 324.

MANGANESE.

Manganese is reported on land owned by the Shasta Copper Company (Furber, White et al., of Redding), in Secs. 1 and 36, T. 33 and 34 N., R. 4 W., near Heroult. A shaft 30 feet deep constitutes the development work. Analysis of some of the ore shows:

20.00% manganese.
34.00% silicon.
6.72% iron.
$1.65 per ton in gold.

MARBLE

Marble is found in Sec. 3, T. 33 N., R. 4 W., about 5 miles east of Kennett. The quality and extent is not known, as the deposit is considerably broken up on the surface and has not been developed.

Bibl.: Report VI, p. 98; Bull. No. 38, p. 107.

MINERAL SPRINGS.

Big Bend Hot Springs are located about 52 miles northeast of Redding, on land owned by J. E. Hill; post office, Big Bend. There are six mineral springs on this land, sulphur and iron, temperature 140° F. Good for rheumatism. No water bottled.

Bibl.: Report XI, p. 29.

Castle Rock is located in Sec. 15, T. 38 N., R. 4 W., about 2 miles north of Castella, at an elevation of 1900 feet. Owner, G. M. Parkinson. There are five mineral springs, waters contain sodium chloride, sodium carbonate, potassium, and a trace of lithium. Good for all stomach troubles. Daily flow 2000 gallons. Temperature 40°. Waters sold on the market.

Bibl.: Report XII, p. 346; Anderson, "Mineral Springs and Health Resorts of California," p. 119.

SANDSTONE.

A few miles northeast of Redding the Cretaceous Chico sandstone forms the surface rocks of Secs. 7 and 18, T. 32 N., R. 4 W. This deposit occurs in thick horizontal beds so that the quarrying of large blocks is a simple matter. Rock has a tawny color, quality is fair.

Bibl.: Bull. No. 38, p. 138.

At the *Texas Spring Quarry,* in Sec. 29, T. 31 N., R. 5 W., owned by California Sandstone and Construction Company of San Francisco, a little work has been done in the past, but the quality is not good on account of the number of niggerheads and fossils contained in the sandstone.

Bibl.: Bull. No. 38, pp. 138–139.

TUFF.

A belt of tuff extends from Clover Creek to Bear Creek, a distance of 5 miles, in Sec. 18, T. 31 N., R. 2 W.; in the forks of old Cow Creek, and South Cow Creek, a bluff of Tuscan tuff rises with steep sides from 30 to 50 feet high. The tuff has a light gray color and easily cuts to any desired form, but hardens on exposure. Being light, it makes a good building material for a temperate climate.

Bibl.: Bull. No. 38, p. 161.

ZINC.

A body of ore carrying zincblende and galena is found in Sec. 21, T. 34 N., R. 1 W. This ledge is 4 feet wide, strike east and west, dip 50° N. Slightly developed by means of a short tunnel. Country rock is shale.

Bibl.: Bull No. 38, pp. 355-356.

The ore of the *Donkey Mine* (Sec. 11, T. 33 N., R. 2 W.) carries considerable zinc, associated with copper, gold, silver and lead. This mine is listed under copper.

There is more or less *zinc* in the form of sphalerite associated with the ores of several of the copper mines of Shasta County, particularly at Bully Hill and at the Afterthought mine.

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SISKIYOU COUNTY.

Field Work in September, 1913.

Introduction.

Siskiyou County, with an area of 3040 square miles, lies along the northern boundary of California, and has Del Norte adjoining it on the west, Modoc on the east and Shasta and Trinity counties on the south. It has an exceedingly broken and picturesque expanse of mountains, and canyons cut by many streams running westerly to the Klamath River and southward to the Sacramento River, the former stream coursing through the county for 70 miles.

The most prominent mountain ranges are the Klamath, Scott and Salmon. Mount Shasta, in the southern part, having an elevation of 14,380 feet, is a noted landmark. The Sierra Nevada lava sheet covers a portion of the eastern part of the county, forbidding both mining and agriculture.

The mineral wealth, which constitutes the basis of Siskiyou's prosperity, is concentrated in various belts and districts. There are two main agricultural sections, the Scott and Shasta valleys, which afford supplies for the surrounding country.

Although the day of simple placer mining has passed, the auriferous gravels still provide the bulk of the county's gold output. Gold dredging is being successfully pursued on McAdams Creek, near Fort Jones; and as there are many acres of gravel that will yield handsome returns by this method of mining, dredging bids fair to become one of the important industries of the county.

Hydraulic mining has been extensively pursued along the Klamath River and important tributaries, and large areas of pay gravel still remain to be worked. The old method of river mining by means of wing-dams has practically passed out of existence.

Quartz mining, which really gives stability to the industry, has made wonderful strides in Siskiyou County during the past ten years, in spite of the lack of transportation facilities, especially railroads. The Oregon branch of the Southern Pacific Railroad, which crosses the county, connects at Montague with the Yreka railroad, thus affording a rail connection for Yreka, the county seat. Wagon roads to the remote mining districts are being constructed as rapidly as the funds of the county will permit.

The unusual strikes of "high grade" ore in the Salmon range, especially in the Homestake and Highland mines, has stimulated lode mining and given the county the publicity it deserves. The Black Bear, with a production record of over $2,500,000, is the most noted gold quartz producer in Siskiyou County. There are many prospects that should

develop into producers with the expenditure of a moderate amount of money. The conditions for mining are ideal, due to the abundance of both water and timber, and the California-Oregon Power Company affords cheap electrical power to many of the mining sections.

The minerals found within the borders of this county are many and widely distributed, among which may be enumerated, gold, platinum, silver, lead, chrome, copper, and coal. There are several mineral springs also, the most famous being the Shasta, on the line of the Oregon branch of the Southern Pacific railroad.

GEOLOGICAL AND TOPOGRAPHICAL FEATURES.

The formation and metalliferous belts of Siskiyou County are not so clearly defined as in the middle counties of the State; the Coast and Sierra Nevada ranges are here merged into one. The strike of the stratification has been changed from west of north to north 20° east.

In the Klamath, Salmon and Scott ranges, the mountains are rough and sharply defined, and table lands are seldom seen, as sharp serrated ridges have replaced them, with deep gorges and precipitous canyons.

Though the mountains of the western half belong to the Coast Range system, their general geological character is that of the Sierras, as granites, diorites and metamorphic slates and limestones, similar to the latter mountain system, comprise their mass. Between these western mountain systems and the lava beds, which cover a large area, including much of the drainage area of the Shasta and Little Shasta rivers and Cottonwood Creek, is a section, the characteristic rock of which is a fossiliferous sandstone. In the Shasta and Willow Creek valleys coal seams are found, stratified with the sandstone; these seams of lignite (coal) of good quality, vary from a few inches to four feet in width and rest on a quartzite substratum, which formed the rim rock of the basin.

Following the quartzite in a westerly direction for about 1 mile, a belt of magnesian rocks containing iron is observed, which continues for some 2 miles, when the main gold-bearing belt of the region is encountered.

DESCRIPTION OF STREAMS.

Klamath River.

This river and its tributaries have been important agents in the distribution of placer gold throughout the country (see photo No. 1). Its source is in the mountain ranges of northern California and southern Oregon, drawing from the Upper and Lower Klamath, Goose and Rhett lakes, and flowing southwesterly into the Pacific Ocean at a point forming the western extremity of the dividing line between Del Norte and Humboldt counties. The length of the Klamath is some

362 miles, the average grade being 12 feet to the mile, 70 miles of which is in Siskiyou County.

Gold is found wherever the river has deposited gravel, whether it be in an old channel a thousand feet above the present stream, or in the river bottom. Below the mouth of Scott River it has cut its way through the northern end of the Coast Range practically at right angles to its trend, and runs through a narrow canyon from a few hundred to several thousand feet in depth, with banks as steep as the material will stand and which are covered with a dense growth of timber and

Photo No. 1. Klamath River near Happy Camp.

brush. At Oak Bar, Happy Camp, Hamburg Bar, Orleans Bar and a few other points, the mountains recede far enough from the stream to admit of a few acres of level land being farmed; the rest of the country is too steep for cultivation.

Bibl.: Report VIII, pp. 582, 584, 585.

Scott River.

Scott River, one of the important tributaries of the Klamath, enters this stream in Sec. 6, T. 45 N., R. 10 W., M. D. M., at an elevation of 1650 feet above sea level. It has a length of 61 miles, an average course of 20° to the northwest, and is fed by a watershed area of 812 square miles, with 26 miles of tributaries. This stream flows through the mineral districts of Oro Fino, Quartz Valley, Callahan and Scott Bar. In the vicinity of Callahan, on the headwaters of this stream and especially on the South Fork, rich deposits of gravel are found,

which have been mined for many years. Below Callahan the river runs through a portion of Scott Valley, a rich and fertile plateau, which is successfully cultivated, and in which are situated the flourishing towns of Etan and Fort Jones. The lower end of the river, for about 4 miles above its mouth, runs through a canyon, and here gold is found in the benches on the hillsides and in bars in the river. Scott Bar, in the center of this district and 2 miles from the mouth of Scott River, is the village from which supplies are distributed to the adjacent territory.

Bibl.; Report VIII, pp. 593, 594, 605, 606.

McAdams Creek.

This stream, a branch of Moffat Creek, tributary to Scott River, rises in the Forest Mountain Range and flows in a southerly direction. The placer ground on this creek, from its source to its junction, a distance of some 10 miles, has been rich, but the valley expands and the soil deepens so rapidly that only shallow depths were worked. It is good dredging ground, however, and the lower end of the stream is being worked by this method of mining.

Bibl.: Report VIII, p. 618.

Yreka Creek.

Yreka Creek, some 10 miles in length, rises in the Forest Mountains, flows in a northerly direction and empties into the Shasta River in Sec. 1, T. 45 N., R. 7 W., M. D. M. It is fed by several tributaries and has been an important gold producer in the past. Near Hawkinsville, 2 miles northeast of Yreka, the county seat, the valley is over 1 mile wide, and there is still a large area of auriferous gravel unworked, due to overburden and difficulty of drainage. Hydraulic elevators have been employed, with but poor success. The scarcity of water has also been another serious handicap.

Bibl.: Report VIII, p. 618.

Indian Creek.

Indian Creek, a tributary to the Klamath River, rises in the lofty snow-clad peaks of the Siskiyou Mountain Range, near the boundary line between California and Oregon. It has a length of 16 miles, flows in a southeasterly direction, and its tributaries, east and west, embrace 14 miles; its watershed area covers 144 square miles. Placer deposits are found along the entire length of Indian Creek. Happy Camp, a village on the west bank of the Klamath River at the junction of the Klamath and Indian Creek, is the distributing point for the country generally between Hamburg and Orleans Bar.

Bibl.: Report VIII, p. 599.

Beaver Creek.

This stream, a tributary to the Klamath River, rises in the Siskiyou Mountain Range, near Mount Sterling. It has a length of 12 miles, a general southwesterly course and is fed by the north and south forks of Hungary Creek, Bumble Bee, West Fork of Beaver and other smaller creeks. Placer mining has been pursued along these creeks for the past forty years, and although worked in a crude way considerable gold has been produced. The formations consist of granite, serpentine, slate and porphyrite-schist, cut by gold-bearing quartz ledges and porphyry dikes, which have fed these watercourses for ages.

Bibl.: Report VIII, p. 591.

Humbug Creek.

This creek, a tributary to the Klamath River, rises in the Humbug Mountains and flows in a northeasterly direction. It has a length of some 10 miles and has been a noted producer of placer gold. Near its source the banks of this stream are steep, the water being confined in a well defined canyon, of heavy grade, but as it approaches the river it widens out, forming large bars, which have been extensively mined. One claim of less than 7 acres has been constantly worked for the last thirty-five years, the output to date exceeding $260,000. Other creeks in this section tributary to the Klamath and which have been noted placer producers are Little Humbug and Barkhouse. From the head of Little Humbug over $2,000,000 was extracted by ground sluicing, and there is still considerable virgin ground to be worked, especially near its mouth, but there is only sufficient water in this creek to allow a two or three months' run each year. Barkhouse, the next creek below Little Humbug, has also been a noted producer, but mining operations are limited on account of the scarcity of water.

Bibl.: Report VIII, p. 591.

Mineral Production of Siskiyou County from 1894 to 1913 (incl.) from Records of State Mining Bureau.

Substances	1894	1895	1896
Gold	$760,781 83	$950,006 43	$1,091,264 82
Platinum	600 00		
Silver		177 30	652 65
Mineral waters		80,800 00	
Totals	$761,381 83	$1,030,983 73	$1,091,917 47

Substances	1897	1898	1899
Gold	$842,123 00	$768,804 00	$991,771 00
Silver	34 00	321 00	100 00
Totals	$842,157 00	$769,125 00	$991,871 00

Substances	1900	1901	1902
Gold	$951,397 00	$883,043 00	$906,989 00
Silver	13,986 00	6,408 00	233 00
Mineral water	45,000 00	175,000 00	187,500 00
Copper			23 00
Totals	$1,010,383 00	$1,067,451 00	$1,094,745 00

Substances	1903	1904	1905	1906
Gold	$613,576 00	$892,685 00	$803,035 00	
Silver	22 00	1,230 00	2,499 00	
Mineral water	50,000 00	50,000 00		
Platinum		21 00	93 00	
Sandstone			1,250 00	$1,500 00
Totals	$663,598 00	$943,936 00	$806,877 00	$1,500 00

Substances	1907	1908	1909
Copper	$89 00		
Gold	398,017 00	$504,156 00	$416,160 00
Lead	140 00	183 00	144 00
Lime	1,000 00	1,680 00	800 00
Limestone	300 00		2,200 00
Mineral water	36,250 00	80,000 00	10,000 00
Rubble	39,000 00		500 00
Sandstone	12,897 00	1,485 00	1,750 00
Silver	3,037 00	6,125 00	2,145 00
Pumice stone			500 00
Macadam			4,528 00
Unapportioned, 1900-1909, inclusive			1,202,742 00
Totals	$490,680 00	$593,629 00	$1,640,969 00

Substances	1910	1911	1912
Crushed rock	$9,475 00	$6,580 00	
Gems	14,745 00	1,000 00	$250 00
Gold	437,376 00	422,297 00	472,314 00
Lime	735 00	120 00	
Limestone	525 00	24 00	
Mineral water	60,000 00	120,000 00	120,000 00
Sandstone	2,000 00	455 00	250 00
Silver	2,322 00	2,561 00	2,960 00
Chrome			2,310 00
Stone industry			609 00
Totals	$527,178 00	$553,037 00	$598,713 00

Substances	1913
Coal	$1,500 00
Gems	250 00
Gold	*180,125 00
Mineral water	120,000 00
Pumice stone	2,000 00
Silver	*1,228 00
Stone industry	4,883 00
Total	$309,986 00

*Production from dredging operations included in Stanislaus total.

ELECTRICAL POWER PLANTS.

The California-Oregon Power Company serves the following towns in Siskiyou County with cheap electrical power: Yreka, Montague, Hornbrook, Dorris, Ager, Hawkinsville, Thrall, Croy, Fort Jones, Oro Fino, Greenview, Walker, Etna, Weed, Sisson, Dunsmuir, and Castella.

The power plants are located at Fall Creek (capacity 2500 k.w.), Shasta River (380 k.w.), Klamath Falls (1500 k.w.), Gold Roy (2500 k.w.), Prospect (4750 k.w.), a total of 11,630 k.w. In addition to the plants mentioned, another is being installed on the Klamath River, near Fall Creek, with a capacity of 4000 k.w. and the system will then have a total generating capacity of 15,630 kilowatts.

CHROME.

Considerable float of chromite is found near the top of the Forest Mountains, in Sec. 13, T. 44 N., R. 8 W., Southern Pacific Railroad Company, owner; and in Sec. 18, T. 44 N., R. 7 W., Wm. Ramus and Carl Hill, Yreka, owners. The country rock is serpentine; the chromite is found in relatively small pieces. No development work has been done. Float of chromite is reported in the vicinity of the Dewey mine, about 10 miles southwest of Gazelle.

Bibl.: Bull. No. 38, pp. 272, 363.

CLAY PRODUCTS.

T. T. Garvey, of Yreka, owns a large bank of reddish colored clay, containing some minute quartz pebbles, in Sec. 27, T. 45 N., R. 7 W., M. D. M. A good quality of brick has been manufactured and used in Yreka.

Bibl.: Bull. No. 38, p. 257.

T. Hamilton, of Fort Jones, formerly made bricks from the surface clay from a deposit in Sec. 2, T. 43 N., R. 9 W.

Bibl.: Bull. No. 38, p. 257.

T. A. Reynolds, of Fort Jones, had an old brick kiln, using surface clay, from a deposit in Sec. 11, T. 43 N., R. 9 W.

Bibl.: Bull. No. 38, p. 257.

Peter Smith, of Etna, owns a bank of clay in Sec. 21, T. 42 N., R. 9 W., M. D. M. This deposit consists of 4 feet of clay of good quality, from which bricks were burned and used in buildings in Etna.

Bibl.: Bull. No. 38, p. 257.

J. Walker, of Greenview, has a deposit of grayish colored clay of good quality, located in Sec. 32, T. 43 N., R. 9 W., M. D. M.; a good grade of bricks manufactured at one time.

Bibl.: Bull. No. 38, p. 258.

COAL.

The coal deposits north of Yreka, in the vicinity of Hornbrook and Ager, have furnished a small amount of coal for domestic use for several years. It is a good grade of lignite, burns freely and leaves no klinkers.

The Black Butte Mountain Deposits near Ager, and the Kosh Creek deposits near Glazier along Kosh Creek in T. 38 N., R. 1 E., have not been developed at all.

The Siskiyou Coal Manufacturing Company's holdings near Hornbrook have been exploited by several open cuts along the croppings. The vein is 5 feet wide, with 30 inches of good lignite. Coal has been reported near Oak Bar, but is inferior in quality to the other deposits.

Bibl.: Report XI, p. 449.

COPPER.

The copper mines and prospects, while of recent development, are worthy of careful consideration, and are widely scattered over the central and northern portions of the county. The formations in which these deposits occur are either peridotite or gabbro, or a metamorphic schist overlying these eruptives, and several of the mountain peaks show the reddish-brown color which peridotite assumes in weathering. In the Happy Camp district, which has been noted for its placer gold production, there are several prospects of merit; and one property, the Grey Eagle, has been developed into a copper mine of considerable magnitude, with a large tonnage of ore blocked out.

Bibl.: Bull. No. 50, pp. 120–141.

Blue Ledge, owned by Blue Ledge Mining Company, of New York, is located in Sec. 21, T. 48 N., R. 11 W., M. D. M., in the Elliott mining district in the Siskiyou Mountain range and near the boundary line

between California and Oregon. Elevation at mine is 4000 feet. Hutton is the nearest post office. The mine is connected by wagon road with Joe Bar, an old placer camp. The ore occurs in a north and south vein, dip vertical, its outcrop being traceable for 3000 feet; walls are micaceous schist. Ore consists of pyrite, chalcopyrite and other sulphides and oxides of iron and copper, the average value being above 6% copper and $5 per ton in gold. Two main tunnels 250 feet apart are connected by winzes and stopes; both show ore and have intermediate drifts showing over 150 feet in a solid body 40 feet wide in places. The workings comprise over 3000 feet of development. A large tonnage of ore blocked out. It is reported that the company has planned the erection of a smelter on the Applegate River.

Bibl.: Bull. No. 50, p. 128.

Copper Queen, in Sec. 3, T. 46 N., R. 7 W., in the Cottonwood mining district, 10 miles northwest of Hornbrook. Owners, J. D. and R. Abbott, of Yreka; comprises 20 acres on Hunter Creek; small ledge in lime and diorite-schist, 110-foot tunnel. Idle.

Bibl.: Bull. No. 50, p. 123.

Davis, in Sec. 12, T. 14 N., R. 6 E., in the Happy Camp mining district, 13 miles southwest of Happy Camp. Owner, R. Davis. Ledge 20 to 30 feet wide in schist and limestone; short tunnels; ledge not found in place as yet; strong gossan cropping, carrying some gold value; bonded to J. D. Farish and eight men employed; F. H. Dakin, superintendent; claims on Clear Creek.

Grey Eagle (formerly known as the *Dewey*), in Sec. 4, T. 17 N., R. 7 E., in the Happy Camp mining district, 8 miles northwest of Happy Camp. Owner, Incorporated Company, of New York; J. D. Farish, manager; Fred H. Dakin, superintendent; comprises 240 acres, patented; on Indian Creek at an elevation of 2550 feet; a strong vein from 10 to 80 feet wide in schist with a northwest and southeast strike and a dip of 45° E.; ore shoot over 300 feet long, consisting of chalcopyrite and pyrite; eight tunnels from 50 to 600 feet in length, six being crosscuts and two on the ledge; and several hundred feet of drifts and raises; large tonnage blocked out; ore carries from 2½% to 18% copper and $1.50 per ton in gold; strong gossan croppings on the surface; five men employed; property located in 1892 and sold to present company in 1908.

Bibl.: Bull. No. 50, p. 132.

Hummer, in Sec. 18, T. 40 N., R. 7 W., in Callahan mining district; owned by Mischler & Rollins, of Callahan. Claims worked to a limited extent by shallow shafts and open cuts; formation is serpentine, though the ore deposits are connected with dikes of quartz-

porphyry which have penetrated the serpentine; ore lies in irregular bodies, consisting of pyrrhotite and other sulphides, carrying copper; ore said to contain nickel. Idle.

Bibl.: Bull. No. 50, p. 123.

Little, in Sec. 12, T. 46 N., R. 12 W., in the Seiad mining district; 10 miles west of Hamburg Bar. Owners, Little & Straisch; comprises 60 acres, located in 1899; ledge 39 feet wide, with northwest and southeast strike and dip of 20° E.; in schist and limestone; 40-foot tunnel. Idle.

Monarch, in Sec. 7, T. 40 N., R. 7 W., Callahan mining district; owned by Monarch Copper Mining Company, of Callahan; 240 acres, patented; tunnels and shafts (shallow); sulphide ore. Idle.

Bibl.: Bull. No. 50, p. 124.

Phillips, in Sec. 6, T. 46 N., R. 12 W., in the Seiad mining district; 14 miles west of Hamburg Bar. Owner, S. Phillips; comprises 40 acres, located in 1900; ledge 30 to 100 feet wide, with northwest and southeast strike and dip 35° E.; in schist and limestone; 110-foot tunnel; strong gossan cropping traceable for 1500 feet; only do assessment work.

Polar Bear, in Sec. 12, T. 40 N., R. 8 W., in the Callahan mining district; owned by Welkes & Sons; comprises one claim; ore bodies 6 feet wide, consisting of chalcopyrite and pyrrhotite, in serpentine; 200 tons extracted, said to carry 17% copper. Idle.

Bibl.: Bull. No. 50, p. 124.

Preston Peak, at head of South Fork of Indian Creek, 1½ miles north of Preston Peak; owned by Preston Peak Copper Mining Company; ledge 20 to 30 feet wide, in diorite; ores are pyrite and chalcopyrite; 300-foot tunnel in ore; ore said to carry 12% copper with gold; one of the pioneer discoveries of the Siskiyou belt. Idle.

Bibl.: Bull. No. 50, p. 132.

Plutus, in Secs. 12 and 14, T. 40 N., R. 8 W., in Callahan mining district; owned by McCarter, of Callahan; comprises five claims; ore, (pyrrhotite with small percentage of copper); occurs in gabbro and serpentine. Idle.

Bibl.: Bull. No. 50, p. 123.

Rainbow, in Sec. 24, T. 40 N., R. 5 W., in the Mt. Eddy mining district, 4 miles southwest of Sisson; owned by Wood & Sheldon Lumber Company; comprises 300 acres; tunnels and open cuts; one tunnel 400 feet long; ledge is 6 feet wide, in serpentine; ore is massive sulphides; gossan croppings 100 to 600 feet wide are exposed for over

a mile on a spur of Mt. Eddy, having a strike of 70° NW. and dip of 60°; company's railroad near property; property was first worked for gold, thirty years ago. Idle.

Bibl.: Bull. No. 50, p. 125.

Rothrop, in Secs. 5, 6, 7 and 8, T. 43 N., R. 8 W., 4 miles northeast of Fort Jones; owned by George Henderson; comprises 15 claims; developed by shafts and tunnels; ledge 6 feet wide in serpentine; some of the ore is reported to carry 20% copper. Idle.

Bibl.: Bull. No. 50, p. 125.

Shiner, in Sec. 7, T. 46 N., R. 12 W., in the Seiad mining district; 12 miles west of Hamburg Bar. Owner, C. Shiner. Comprises 40 acres, at an elevation of 2000 feet; located in 1899; ledge 30 to 100 feet wide, with northwest and southeast strike and dip of 30° E., in schist and limestone; 80-foot tunnel; strong gossan cropping; ore is chalcopyrite. Only do assessment work.

Tebbe, in Sec. 32, T. 4 N., R. 9 W., in the Oak Bar mining district; 4 miles north of Oak Bar. Owner, G. A. Tebbe. Comprises 40 acres; ledge 30 feet wide in schist and limestone; 120-foot tunnel in ore. Idle.

Welch, in Sec. 1, T. 46 N., R. 12 W., in the Seiad mining district; 14 miles west of Hamburg Bar. Owner, E. Welch. Comprises 40 acres, located in 1899; ledge 30 feet wide, with northwest and southeast course and dip of 40° E.; in schist and limestone; two tunnels, 30 and 60 feet long; strong gossan cropping. Only do assessment work.

Yellow Butte, in Sec. 25, T. 40 N., R. 5 W., 15 miles from Montague, on the north slope of Mount Shasta; owned by Yellow Butte Mining Company; L. D. Ball, superintendent; vein is 5 feet wide, in schist and granite; strike north and south; dip 60° W.; ore is massive sulphide; tunnels and shafts. Idle.

Bibl.: Bull. No. 50, p. 126.

GOLD.

The main gold-bearing belt of Siskiyou County consists of metamorphic slates, granites, diorites, and limestones, with occasionally intrusive masses of porphyry, trap and syenite. This belt is from 5 to 12 miles in width and about 60 miles long, widening and narrowing at places on its line of strike, which varies from N. 20° to 30° E. In some places it is veined and seamed with stringers of quartz; in others it is soft, carrying talc in excess, with irregular bunches of quartz, rich in gold, designated in hydraulic mining as "seam diggings" and being easily worked with a stream of water under a heavy pressure head. In other localities on the belt, where the formation has been fissured,

or near the line of contact, quartz veins occur either singly or in groups, and as a rule are small, but rich in gold.

This belt is interrupted and broken at several points and is by no means prolific in auriferous quartz veins throughout its entire extent, nor do the same rocks prevail in all the quartz districts.

A striking feature of the occurrence of the auriferous veins is their relation to the culminating peaks of the mountain systems crossed by the belt, for they conform to the lines of foliation of the ranges, being especially noticeable in the Salmon Range, New River, Knownothing, Deadwood and Humbug districts. Quartz Valley and Oro Fino, on opposite sides of a minor isolated mountain, are the only exceptions to the rule indicated.

Salmon Mountain, composed of eruptive rocks, porphyries and granites, seems to have been a disturbing element, as auriferous rocks do not come to the surface for about 10 miles beyond. Reaching as far as the known southerly limit of this gold-bearing belt extends, and crossing it, a belt of argillaceous slate and porphyry, having a width of 2 miles, is encountered, and then a decided belt of serpentine from 3 to 6 miles in width is entered, traceable for several miles on its line of strike. A belt of micaceous schist is observed at Scott's Bar, and westerly from this point belts of granite, limestone, and syenite are alternately crossed, until another belt of auriferous slates is entered, which has been but slightly prospected.

DESCRIPTION OF MINING DISTRICTS.

Salmon River District.

This district, the largest in Siskiyou County, comprises its entire southwestern corner, and includes the drainage area of the Salmon River and its tributaries. Topographically, it is a tangle of mountain ridges separated by precipitous canyons and river gorges. A wagon road 43 miles in length connects Etna, in Scott Valley, with Forks of Salmon, a small town located at the junction of the North Fork of the Salmon River. All the fairly level land in the district consists of a few bars on the Salmon River and its branches, so that this section is practically dependent on supplies from the outside.

Its mining industry, which is much scattered, is diversified among the several branches of placer and quartz mining, the former being followed along the Salmon River and its two principal branches, and to a less extent in some of the smaller side canyons making up into the gold-bearing quartz belts; large deposits are still untouched on the main river and on the South Fork. It is in quartz mining, however, that the permanent value of the district is to be realized. The main gold-bearing rock belt of the county crosses through the middle of this section.

In the geological center of the district, in the vicinity of Sawyer's Bar, several noted gold producers have been developed. They lie at the heads of Black Bear, Eddy's and White's gulches, from 4 to 10 miles distant from Sawyer's Bar. Quartz ledges on Jackass Gulch on the north side of the North Fork are being prospected and some pay ore developed. The Black Bear, Klamath, Gold Ball, Fagundez, Uncle Sam and Gold Run are the noted mines in this location. There are a number of prospects, also, which may develop into producers. In the same district near Snowden the recent strikes of "high grade" ore have caused considerable excitement. The Homestake, Highland, Overton, Zarina and Advance are the best known quartz properties, while the Big Cliff and Hardscrabble comprise two of the many promising prospects.

As a rule the country is heavily timbered and brushy, precipitous, and the surface broken, so that the quartz veins rarely show in place at the surface.

Bibl.: Report XI, p. 423.

Quartz Valley.

This district, occupying the northwest corner of Scott Valley, has two distinct kinds of placer mines. At the southern end of the valley the pay gravel lies on a flat, nearly level bedrock, without defined channel rims, covered with 60 feet of soft pebbly gravel and alluvium. The gold is coarse and water-worn and the deposit has been worked by drifting. Its source is probably the gravels of an old buried river, traces of which are observable in Douglas Hill, and in benches on the west side of the valley north of where Shackelford Creek enters it. Other traces of this old channel are found on the western edge of Scott Valley as far south as Callahan. The main placer deposit lies on the eastern side, and appears to be the result of the direct erosion of the ferruginous limestones that compose the western slope of the mountain separating Quartz Valley from the main Scott Valley. These limestones are seamed with auriferous quartz veins for some 5 miles. On the eastern slope of this mountain only one ravine seems to have been eroded deep enough to get to the gold bearing rocks, but on the Quartz Valley side there are four such ravines. These places consist of angular fragments of country rock and quartz with sand and clay, in depth from 1 to 30 feet, covered with a deposit of clay and surfaced with alluvium. The shallow placers near the heads of the ravines were worked out by the early-day miners. The gold is generally fine, rough and angular; and at one point from 8 acres of ground, over $200,000 was extracted, by means of hydraulic elevators.

Bibl.: Report XI, p. 434.

Oro Fino.

A low range of hills separates Quartz Valley from Oro Fino. This district is 22 miles southwesterly from Scott Bar by the course of the river. The auriferous dirt is evidently derived from the erosion and decomposition of the mountain sides in the immediate vicinity, as but few pebbles or gravel that show the action of running water or wash are found intermixed. A small ravine tributary to Oro Fino Creek constitutes practically all the placer ground in this district, and mining operations have been confined to the use of hydraulic elevators. The average fineness of the gold in this district is 785. Hydraulic washings have yielded from 75 cents to 85 cents per cubic yard of gravel. The two principal placer mines are the Eastlick Brothers and the Wright & Fletcher. The quartz veins, while numerous, all carry more or less gold and are small, and the gold generally occurs in pockets, in the limestone. The Green Mountain Tiger and Johnson have been the main quartz producers in this section.

Bibl.: Report VIII, p. 607; XI, p. 437.

Scott Bar.

This district, containing both placer and quartz mines, is situated on Scott River just above its junction with the Klamath, and was the first locality to be mined in Siskiyou County; it has been a remarkably

Photo No. 2. Scott Bar.

rich district, although it includes a very small area (see photo No. 2). The gold, generally found on the bedrock, occurs in the form of nuggets, and is smooth and water-worn.

There are several large quartz ledges on Quartz Hill, which is across the river from Scott Bar, and one ledge is said to have yielded the Quartz Hill Hydraulic and Quartz Mining Company considerable gold. The surface has been rich hydraulic ground.

Bibl.: Report VIII, p. 605; XI, p. 447.

Humbug Creek.

This district, on the northeastern slopes of Old Baldy, is exclusively a quartz mining region, and is situated in the headwater forks and canyons of Humbug Creek, about 16 miles northwest of Yreka. The first mining in the district was carried on in 1854, and since that time considerable gold has been produced, although the operations have been practically confined to surface workings, due to a theory that the pay ore did not go down. As a matter of fact, a more intelligent exploration of the ore bodies has disproved the conclusions of the pioneer miners, and the properties that have been worked to any depth at all have yielded good returns, the Spencer and Mountain Belle mines being examples. The ledges in the serpentine are small, averaging 1 foot in width, and upon reaching the water level carry the gold largely with the sulphurets. The adjacent slates and granites are full of ledges carrying low-grade gold ores. The sulphurets consist of pyrite, blende and galena.

Bibl.: Report XI, p. 444.

Cottonwood.

This district, containing both placer and quartz mines, is located on the north side of the Klamath River, some 20 miles northeast of Yreka, and to the west of Hornbrook, a station on the Oregon branch of the Southern Pacific Railroad. It was originally noted for its rich, shallow diggings in Cottonwood Creek and the ravines tributary to it from the west. The old blue lead channel, famous for its rich gravel, is here exposed by erosion of the sandstone capping and cut through by the Klamath River. The gravel is blue and strongly cemented and compacted, while the bank contains considerable pipe clay hardened almost to the consistency of stone and filled with angular rock fragments. The gold is coarse, occurring mostly on or close to the bedrock. Both the channel and the capping are considerably displaced, and dip on an angle of about 12° to the east. In 1887 the outlet of the channel was discovered on the Klamath River, although the blue gravel had been mined in one of the ravines tributary to the Cottonwood, several years previous to that time. Some of the gravel on the bedrock gave returns of $6 per cubic yard.

The quartz prospects have been only partially developed and there is but little mining activity in this district at the present time. The country rocks, slate and quartz-porphyry contain many quartz ledges which arry gold values sufficient to warrant careful investigation.

The *Hazel,* with a gold production record of over $500,000, is the only quartz property that has been worked to any extent.

Bibl.: Report XI, p. 448.

Callahan.

The placer mines in this district are confined to the old gravel channel and bars of the South Fork of Scott River. The channel and high bars of the main Scott River, below the junction of the South and East Forks at Callahan, was mined for a distance of 3 miles, and a large annual gold output obtained. The high bars have been worked out and abandoned for a number of years, and the gold in the river channel is at such a depth that it cannot be profitably mined. On the South Fork, a few claims in the gulches and high bars are worked whenever water is available. On Jackson Creek, one of the headwater streams of the South Fork, 7 miles above Callahan, hydraulic mining is pursued on a small scale. The Montezuma River claim, 1 mile southwest of Callahan, was the largest gold producer, having a record of $50,000 annually.

Bibl.: Report XI, p. 433.

Happy Camp.

This district, also known as Indian Creek, is situated at the confluence of Klamath River and Indian Creek, some 70 miles west of Yreka, and contains both placer and quartz mines. The shallow and more easily removed gravel deposits have been worked out, but the benches are still being hydraulicked for their gold content. There is a large expanse of mineral land yet to be developed. The shallow diggings yielded large returns and were worked over by the Chinese after being abandoned by the white miner. The Classic Hill, on Indian Creek, one of the famous hydraulic mines of this district, was worked for a number of years by Chinese. The formation consists of a soft talcose slate, intercalated with stringers of quartz, which in places concentrate and form a well defined quartz vein, rich in gold, the deposit being known as "seam diggings." The quartz prospects are worked in a very limited way. The Grey Eagle copper mine is the only developed property in the district.

GOLD MINES—QUARTZ.

Advance, in Sec. 17, T. 40 N., R. 10 W., in the Liberty mining district, 13½ miles southeast of Etna Mills, in the Klamath Reserve. Owners, Advance Mining Company, of Denver; president, H. E. Wood; watchman, C. Ritz. Comprises 100 acres, patented, on Cow Creek. Short ore shoots in dioritic schist and limestone; 400-foot tunnel, drifts and stopes. Equipment consists of 1500-foot tramway, dwellings, and 5-stamp mill, driven by waterpower (water from Russian Creek,

through 2 miles of flume). Idle for several years. Ore low grade and free milling. Hardscrabble prospect to the south.

Bailey, in Sec. 35, T. 46 N., R. 9 W., in the Deadwood mining district, 7 miles northwest of Fort Jones, at an elevation of 5000 feet. Owner, L. Bailey. Comprises 80 acres on Indian Creek. Short ore-shoot, in diabase. Worked for pockets. Some rich ore on the surface. Small producer. Idle at present.

Bibl.: Report VIII, p. 624.

Baker, in Sec. 15, T. 44 N., R. 9 W., in the Deadwood mining district, 7½ miles north of Fort Jones, at an elevation of 5000 feet. Owner, George Baker. Comprises 60 acres on Indian Creek. Short ore-shoot in slate. Worked for pockets. 300-feet tunnel. Old 5-stamp mill, driven by waterpower. Small producer.

Bibl.: Report, VIII, p. 625.

Bender, in Sec. 18, T. 42 N., R. 11 W., in the Liberty mining district, 4 miles north of Etna Mills, in the Klamath Reserve. Owner, A. A. Chamberlain. Comprises 40 acres, at an elevation of 3300 feet. Short ore-shoot in limestone and diorite. 340-foot tunnel and 250 feet of drifts. One 3½-foot Huntington mill, in poor condition. Some rich specimens found near the surface. Idle at present.

Ben Neil, in Sec. 10, T. 44 N., R. 9 W., in the Deadwood mining district, 11 miles northwest of Fort Jones at an elevation of 7100 feet. Owner, B. Neil. Comprises 40 acres. Short ore shoot in diorite; 100-foot tunnel. Small pockets taken out. Idle.

Big Ledge, formerly known as the *Lewis,* in Sec. 8, T. 43 N., R. 9 W., in the Oro Fino mining distrcit, 6 miles northeast of Greenview. Owner, G. Lewis. Comprises 20 acres. Pockets in diabase. One ore-shoot is 100 feet long and 15 inches wide; 360-foot tunnel. Only do assessment work. Idle.

Bibl.: Report XII, p. 277; XIII, p. 388.

Black Bear, discovered in 1860, is the most noted and largest quartz producer in Siskiyou County. It is in Sec. 13, T. 39 N., R. 12 W., in the Liberty mining district; 9 miles south of Sawyer's Bar in the Klamath Reserve. Owners, Black Bear Consolidated Mining Company, of Rollin; John Daggett, president; leased to Rollin Mining Company of San Francisco; J. L. Dunscomb, president; W. A. Farish, Jr., superintendent. The ore bodies occur in lenticular shaped deposits, which pinch out at times on the footwall side. The holdings comprise 70 acres of patented ground, consisting of the Black Bear, South Black Bear and Yellow Jacket claims, with 10 acres for millsite; workings consist of tunnels and two shafts; altitude, 3600 feet; water supply from Black Bear and Auges Creek, through two flumes, each 1 mile long, and

1600 feet of pipe; length along lode, 4500 feet; length of ore shoot, 150 feet; width of ore shoot, 3 feet; footwall, slate; hanging-wall, slate; number veins, two.

Black Bear and east and west crossing at right angles; character of ore, free milling; strike, north and south; dip, 40° E.; greatest vertical depth below outcrop, 600 feet; length driven on vein, 1500 feet; workings, six tunnels from 100 to 700 feet long; old shaft 550 feet deep (six levels); new shaft on Black Bear claim is 475 feet deep (size 10′ x 4′), sunk at an angle of 45° (3 levels); 4000 feet of drifts from old shaft, all to the west, several crosscuts; raise 3′ x 5′ x 30′, in new shaft from third level (200 feet); old stopes all filled; source of power, water and electricity; mine equipment, hoist, cars, compressor plant, compressor pump, tools, shops, assay office, dwellings, and 100 h.p. electric plant with 2 miles of power line; reduction equipment, 16 stamp mill, electrically driven (stamps weigh 650 pounds); number men employed, top 7, mine 2, total 9; cost (per ton): development, $2.00, mining $1.50, treatment $0.80, general $0.60; production to date, $3,100,000.

White Bear prospect to the north. From 1872 to 1881 the Black Bear mine paid $1,000,000 in dividends; most of the work performed on Black Bear claim; good wagon road from Sawyer's Bar to the mine.

Bibl.: Report VIII, pp. 620, 621; X, p. 656; XIII, p. 389.

Black Hawk, in Sec. 31, T. 46 N., R. 7 W., in Virginia Bar mining district; 5 miles north of Gottville in Klamath Reserve. Owners, Ladd & Ogden. Comprises 40 acres; formation granite and schist; ore found in small pockets; 100 foot tunnel; only do assessment work.

Blind Lode, in Sec. 18, T. 43 N., R. 9 W., in the Oro Fino mining district; 5½ miles northeast of Greenview. Owner, H. J. Diggles; comprises 20 acres of patented land, located in 1876; 150-foot ore shoot, 6 inches wide in diabase; four tunnels, longest being 600 feet; some rich ore extracted; said to have produced $40,000. Idle.

Bibl.: Report, XII, p. 278; XIII, p. 390.

Blue Jay, in Sec. 11, T. 47 N., R. 8 W., in Virginia Bar mining district; 5½ miles north of Gottville in Klamath Reserve. Owners, Blue Jay Mining Company; president, Mrs. P. D. Bennell; secretary, P. Billings; home office, Cleveland, Ohio; comprise 160 acres of patented land, purchased from Southern Pacific Railroad Company; formation, schist and diorite; one vein 150 feet long and 5 feet wide; low grade; two tunnels, 250 and 400 feet long; 10-stamp mill built by Union Iron Works; 1000-pound stamps; two Johnson concentrators; water power and steam; 2½ mile ditch from North Fork of Empire Creek; small production. Idle since 1907.

Blue Lead, in Sec. 26, T. 42 N., R. 9 W., in the Liberty mining district, 5 miles southeast of Etna Mills in the Klamath Reserve. Owner, L. H. Cory; comprises 40 acres of patented land; short ore shoot in diabase; rich on the surface; 580-foot tunnel, old 80-foot shaft and drifts comprise several hundred feet of development work; old 4-stamp mill (650-pound stamp); said to have produced $40,000. Idle since 1908.

Bonanza, in Sec. 14, T. 46 N., R. 7 W., in Cottonwood mining district; 10 miles southwest of Hornbrook in Klamath Reserve. Owners, Klondike Mining and Milling Company; president, J. P. Kleprock; secretary, L. P. Kleprock; home office, Long Beach; discovered in 1883 by C. Dovey; formation hornblende schist and granodiorite; short ore shoot; pocket mine; 1600-foot tunnel; equipment, dwellings and 5-foot Huntington mill; locator took out $10,000 in a pocket. Idle.

Boyle, in Sec. 8, T. 45 N., R. 8 W., in the Humbug mining district; 14 miles west of Yreka in the Klamath Reserve. Owner, C. E. Bunker; 100 acres located in 1880; two parallel veins, strike N. 40° W., and dip 60° S.; ore shoot is 200 feet long and 2 feet wide; formation is slate; five tunnels from 40 to 900 feet in length; only do assessment work. Idle.

Bibl.: Report XII, p. 278; XIII, p. 390.

Brown Bear, formerly known as *Golden* and *Eveleth's,* in Sec. 2, T. 39 N., R. 11 W., in the Liberty mining district; 3 miles southeast of Sawyer's Bar in the Klamath Reserve. Owners, Swain and Cleaver; comprises 100 acres on White's Gulch at an elevation of 3100 feet; 160-foot ore shoot, 18 inches wide, with a course of N. 20° E. and dip of 25° E.; 480-foot tunnel, drifts and stope; 4-stamp mill, driven by water power, from White's Gulch through 1½ miles of ditch and ½ mile of flume. Idle at present; has been a producer.

Bibl.: Report XII, p. 283; XIII, p. 402.

California Consolidated, formerly known as the *Golden Ball mine,* in Secs. 16 and 17, T. 39 N., R. 11 W., in the Liberty mining district; 3½ miles southwest of Sawyer's Bar in the Klamath Reserve. It is owned by the California Consolidated Mining Company; W. H. Young, of Oakland, president; Geo. Ball, superintendent; comprises 384 acres, 17 being patented; has been a producer and some ore still in sight, but no system of mining was pursued, so that much useless work was performed; altitude, 3800 to 4700 feet; fissure vein; length of ore shoot 1000 feet; width 6 feet; free milling; strike N. 20° to 40° E., dip 10° to 40° SE.; footwall, slate (soft); hanging-wall, slate; greatest vertical depth below outcrop, 600 feet; length driven on vein, 1000

feet; two levels, one at 50 and other at 125 feet; drifts, 160 feet, from 50-foot level, and 80 feet from 125-foot level; another from Stevens tunnel is 140 feet northeast and another 250 feet southwest; two crosscuts, 120 feet long; two winzes, each 60 feet deep; seven raises; two stopes in Stevens tunnel, each being 40 feet by 40 feet; several open cuts; equipment, 25 h.p. compressor, small hoist, 150 h.p. electrical plant (on North Fork of Salmon River at Sawyer's Bar) with 3 miles of power line, 1500-foot tramway, dwellings, and 20-stamp mill driven by electricity. Idle. Production to date is $473,500; idle since 1910; only assessment work being done; property should be a dividend payer if properly managed; said to be a continuation of the Black Bear lode.

Bibl.: Report XII, p. 282; XIII, p. 402.

Cape Cod, in Secs. 18 and 19, T. 45 N., R. 7 W., in Greenhorn mining district; 6 miles west of Yreka, in the Klamath Forest Reserve. Owners, Le May & Bulis; consists of 115 acres (40 acres patented); located in 1885; formation, slate and porphyry; two parallel veins, shoot 300 feet long and 14 inches wide; 300-foot tunnel; produced $12,000. Idle.

Central, in Sec. 34, T. 48 N., R. 8 W., in Hungry Creek mining district, 16 miles northwest of Hornbrook. Owners, Coil and Haslett. Located in 1893, 20 acres. Short ore shoots; ledge 2 feet wide; two tunnels, one 400 feet long; formation, granite and schist; free milling. Idle.

Champion, in Sec. 32, T. 12 N., R. 6 E., 10½ miles from Orleans, in the Cottage Grove mining district in Klamath Reserve. Owners, J. A. Hunter et al.; 180 acres, located in 1899; two veins, in porphyry; still in ore in workings; equipment, dwellings and one stamp mill (800-pound stamp) driven by water power, and 2-ton cyanide plant; water from Ten Eyck Creek through 2000 feet of ditch; claims are on the east slope of Prospect Hill; owner claims to have 14,000 tons of $15 rock in sight; three men employed; adjoins Twan & Hannan prospect.

Cherry Hill, in Sec. 25, T. 45 N., R. 8 W., in the Greenhorn mining district; 6½ miles southwest of Yreka in Klamath Reserve. Owner, Incorporated Company; several tunnels, longest being 200 feet; formation is diorite and porphyry; old 3-stamp mill, driven by steam power; adjoins Mt. Vernon on the west; been idle for a number of years; small production record.

Columbia, in Sec. 16, T. 45 N., R. 9 W., in the Scott River mining district, 7 miles northeast of Scott Bar in the Klamath Reserve; elevation of 4700 feet. Owner, Scott River Mining Company, of Seattle; C. F. Lee, president; comprises 40 acres, on Old Baldy Moun-

tain; located in 1882; short ore shoot in slate and diabase; workings consist of 700-foot tunnel and 120-foot shaft; ore is free milling near the surface, but base with depth; equipment consists of dwellings and 10-stamp mill driven by steam and water power; only do assessment work; said to have been a producer at one time.

Bibl.: Report XII, p. 280; XIII, p. 394.

Condensed, in Sec. 12, T. 38 N., R. 11 W., in the Liberty mining district; 15 miles southeast of Sawyer's Bar in the Klamath Reserve. Owner, W. H. Cady; comprises 60 acres at an elevation of 2400 feet; short ore shoot in granite; little high grade found on footwall side; 220-foot tunnel. Idle.

Connor, in Sec. 18, T. 43 N., R. 9 W., in the Oro Fino mining district; 5 miles northeast of Greenview. Owner, J. Connor; comprises 20 acres short ore shoot; pay in pockets; 500-foot tunnel; said to have produced $15,000. Idle.

Bibl.: Report XIII, p. 395.

Crawley, in Sec. 22, T. 40 N., R. 8 W., in the Callahan mining district, 1½ miles southwest of Callahan in the Klamath Reserve. Owner, C. A. Warden Estate; comprises 60 acres; short ore shoots; pay ore occurring in pockets; in hornblende schist; 600-foot tunnel and 500 feet of drifts, 30-foot stope; old 2-stamp mill, 650-pound stamps; said to have produced $60,000; only do assessment work.

Bibl.: Report XIII, p. 396.

Cub Bear and Blue Jeans, in Sec. 9, T. 40 N., R. 10 W., in the Liberty mining district, 12 miles southeast of Etna Mills in the Klamath Reserve. Owners, Siskiyou Syndicate, of Los Angeles; president, I. J. Luce; secretary, M. Marx; superintendent, C. Ritz; comprises 100 acres; elevation 5800 feet; veins, two in number, occur in hornblende schist and quartz-porphyry; three short tunnels and open cuts, and ore being removed from the latter at present; good prospect; 80 tons milled, which gave returns of over $20 per ton; five men are employed on the Highland lode; discovered in 1898 by Chas. Cory.

Cummings, formerly known as the *McKeen,* in Sec. 36, T. 40 N., R. 9 W., in the Callahan mining district, 3½ miles southwest of Callahan in the Klamath Reserve; has been one of the best quartz producers in this district. It is owned by the Shasta Mining Company, of Callahan, with James McKeen as manager-superintendent, and comprises 200 acres, patented, on Wildcat Creek at an elevation of 4200 feet; strike of the vein is N. 40° E., dip 40° SW.; ore shoots are short, being 130 feet long and 3 feet wide, all in granite; main tunnel is 800 feet long and, together with the drifts, crosscuts and stopes, comprise several thousand feet of work, but no depth has been

attained; old Kinkead mill (driven by water power) and a dwelling, on the property; has been a good producer, said to exceed $500,000, and ore is free and easily worked; idle at present; has been worked since 1874.

Bibl.: Report XII, p. 280; XIII, p. 396.

Dewey, one of the noted quartz mines of Siskiyou County, is located in Sec. 23, T. 42 N., R. 8 W., in the Gazelle mining district; 12 miles southwest of Gazelle in the Klamath Reserve. It is owned by the Squaw Mining Company and comprises 100 acres, patented, at an elevation of 6800 feet; the strike of the vein is N. 40° E., dip 30° SE. The ore occurs in granodiorite, having a width of 3 feet; workings consist of a shaft 400 feet deep, a tunnel 920 feet in length, drifts, raises and stopes, all comprising several thousand feet of development work; equipment consists of hoist, dwellings, and old 10-stamp and Huntington mills (poor condition) operated by steam and water power; property said to have produced $900,000; discovered in the early eighties; idle since 1907.

Double Eagle and Little Quartz, in Sec. 26, T. 46 N., R. 9 W., in Oak Bar mining district in Klamath Reserve, 30 miles west of Hornbrook. Owner, H. H. Barton; comprises 20 acres; pocket mine; ore is hornblende schist and granitic-porphyry; 120-foot tunnel; produced $10,000, ore being crushed in an arrastra. Idle.

Bibl.: Report XIII, p. 397.

Eliza, in Secs. 4 and 9, T. 45 N., R. 8 W., in the Humbug mining district, 15 miles west of Yreka in the Klamath Reserve. Owners, Shur, Yunker & DeWitt, of Yreka. Group comprises 100 acres, located in 1865 by D. M. Lash; relocated in 1892 by present owners. Elevation is 4500 feet. There is a good wagon road from the property to Yreka. The location covers the lode for a distance of 4500 feet. The fissure vein occurs in quartz-porphyry and diabase, the former being the footwall and the latter the hanging-wall. The strike is N. 20° E. and dip 45° E.; ore shoot is 200 feet long and 5 feet wide; a 1400-foot tunnel has been driven on the vein, giving 360 feet of backs; above this lower tunnel there are four others from 100 to 800 feet in length; there are five stopes in all; equipment consists of dwellings and 10-stamp mill. Owners claim an ore reserve of 40,000 tons of value of $5 per ton and a production to date of $150,000; two men are employed doing development work in the lower tunnel; ore free near surface, but somewhat base with depth.

Elk Creek, in Sec. 3, T. 45 N., R. 7 W., in Hawkinsville mining district, 6 miles north of Yreka. Owners, Elk Creek Mining Company; president, L. F. Colburn; secretary, J. E. Harmon; home office, Yreka;

100 acres located in 1903, in Klamath Reserve; three parallel veins; 100-foot ore shoot 14 inches wide; formation, slate and porphyry; two tunnels 600 and 450 feet long; 10-stamp mill driven by electricity; production $20,000. Idle.

Fagundez (see *Humpback*).

Fleetwood and Nannie S., formerly known as *Old Jackson*, in Sec. 5, T. 45 N., R. 8 W., in the Humbug mining district, 16 miles west of Yreka. Owner, L. W. Cousins; comprises 80 acres; short ore shoots in granitic-porphyry; seven tunnels from 5 to 800 feet in length. Idle; only do assessment work.

Franklin, in Sec. 16, T. 44 N., R. 9 W., in the Deadwood mining district, 8 miles north of Fort Jones at an elevation of 5500 feet. Owners, Miller & Arnold; comprises 40 acres on Indian Creek; ore shoot is 120 feet long and 22 inches wide, with slate footwall and quartz-porphyry hanging-wall; 600-foot tunnel, drifts and 60-foot stope; claim production of $90,000; ore runs about $25 per ton and is worked in Baker's mill; leased to Wells & Brown. Idle since July, 1913; 20 tons of $25 rock on the dump.

Golden Eagle, formerly known as the *Sheba*, in Sec. 7, T. 44 N., R. 9 W., in the Deadwood mining district; 10 miles north of Fort Jones; was one of the producers in this section. It is owned by the Indian Creek Mining Company of San Francisco; president, I. J. Coe, and superintendent, T. E. Morrison; comprises 80 acres, patented; ore shoots are 200 feet long and 15 inches wide, with diabase footwall and quartz-porphyry hanging-wall; 750-foot tunnel, drifts and stopes, making several thousand feet of development work; the equipment, consisting of 50 h.p. boiler and 5-stamp mill, have been removed from the property and company has closed down and practically abandoned the buildings; has paid some dividends.

Bibl.: Report VIII, p. 625.

Golden Seal, in Sec. 18, T. 43 N., R. 9 W., in the Oro Fino mining district, 5 miles northeast of Greenview at an elevation of 3200 feet. Owner, V. Pitz; comprises 20 acres, located in 1885; 300-foot ore shoot, 8 inches wide, in syenite and quartz-porphyry; 525-foot tunnel on the vein; a few pockets of high grade taken out. Owner works the claim in the winter.

Golden West, formerly known as the *King*, in Sec. 15, T. 39 N., R. 10 W., in the Salmon River mining district, 13 miles west of Callahan, in the Klamath Reserve. Owner, J. S. Baggs; comprises 60 acres on Trail Creek at an elevation of 7000 feet; fissure vein, in schist; 200-foot tunnel, still in ore; one man is employed; good prospect, with well-defined ledge of free milling ore, 4 feet wide and running from $8 to $15 per ton; discovered in 1904.

Gold Hill, formerly known as the *Gilta,* in Sec. 12, T. 9 N., R. 7 E., in the Liberty mining district, in Klamath Reserve, at an elevation of 3500 feet. Owner, E. A. Dannenbrink; comprises 60 acres of patented land; ore shoot is 250 feet long and 3 feet wide, in slate and diorite; several thousand feet development work, consisting of tunnels, crosscuts and stopes; equipment consists of dwellings, and 10-stamp mill operated by steam and water power, idle at present; twelve men employed, doing prospect work; property has been a producer.

Grizzly Gulch, in Sec. 14, T. 44 N., R. 9 W., in the Deadwood mining district, 10 miles north of Fort Jones at an elevation of 7000 feet. Owner, J. Shelly; comprises 60 acres; short ore shoots in diabase; worked for pockets; said to have produced $4000 from 80-foot tunnel. Idle.

Gumboat, in Sec. 15, T. 45 N., R. 9 W., 8 miles east of Scott Bar, in the Scott River mining district in the Klamath Reserve. Owner, A. Simon; comprises 40 acres; ore is base with depth (some chalcopyrite), occurring in slate; length of ore shoot not determined; 120-foot tunnel; 60-foot shaft; only do assessment work.

Bibl.: Report XIII, p. 404.

Hansen, formerly known as *Knownothing Creek,* in Secs. 1 and 12, T. 9 N., R. 7 E., in the Liberty mining district, 8½ miles southwest of Forks of Salmon, in Klamath Reserve. Owners, Roberts & Hagland; comprises 60 acres of patented land, located in 1880; short ore shoot, in slate and quartz-porphyry; several tunnels, longest being 850 feet, equipment, dwelling and old arrastra; two men employed doing prospect work; has been a small producer.

Bibl.: Report VIII, p. 622.

Hardscrabble, in Sec. 17, T. 40 N., R. 10 W., in the Liberty mining district, 14 miles southeast of Etna Mills in the Klamath Reserve. Owner, Hardscrabble Mining Company, of Los Angeles; C. B. Parrott, president; John Nefroney, superintendent; comprises 140 acres, at an elevation of 6100 feet; length of ore shoot not determined; country rock in dioritic-schist; 400-foot tunnel; two men employed. Highland Mine to the northeast.

Hazel, in Sec. 25, T. 47 N., R. 8 W., in the Cottonwood mining district, 4 miles southwest of Hornbrook, is the only large producer in this district. It is owned by the Hazel Gold Mining Company, of Chico; J. A. Jillson, president, and J. W. Roper, secretary. The group comprises 80 acres of patented land in the Klamath National Forest Reserve at an elevation of 2800 feet. There are three veins, known as the Potato Patch, "C" and Hazilett, which occur in the slate, the last two being practically parallel. The ore shoot is 150 feet long and 3 feet in

width, with a 40° dip to the south. There are five tunnels from 100 to 1500 feet in length, all in the vein, comprising, with the drifts and stopes, several thousand feet of development work. The equipment consists of dwellings, assay office, and a 10-stamp Hendy mill (850-pound stamps) driven by waterpower from Ditch Creek through 1 mile of ditch. The property is said to have produced $800,000, but is idle at the present time. It was discovered in 1883 by H. Hazilett and then sold to the present owners.

Hicks, formerly known as *China Gulch.* In Sec. 2, T. 46 N., R. 7 W., 7 miles northwest of Hornbrook in the Klamath Reserve. Owner, J. T. Hicks. Comprises 40 acres. Ore shoot said to be 600 feet long, but only 3 inches wide on the surface, occurring in granite. Surface stripped of overburden and ore exposed a few feet below, which was crushed in an arrastra; 150-foot tunnel; 8-foot arrastra, run by water power; tailings impounded (150 tons on hand), which are to be treated in cyanide plant soon; said to assay from $5 to $15 per ton. Idle at present. Small producer.

Highland, in Sec. 16, T. 40 N., R. 10 W., in the Liberty mining district, 11 miles southeast of Etna Mills in the Klamath Reserve, is one of the noted quartz mines of this county. It is owned by the Belgium-Bohemian Mining Company, of Belgium. H. E. Mattern, superintendent. Comprises 100 acres at an elevation of 6400 feet. Supplies are brought over a 3-mile trail by means of pack animals; ore shoots are about 130 feet long and 2 feet wide, having a strike of N. 40° E and a dip of 30° SE.; footwall is dioritic-schist and hanging-wall is quartz-porphyry; workings consist of tunnels, the main tunnel having a length of 600 feet; there are several thousand feet of development work, all near the apex of the mountain, so that only a shallow depth has been obtained; equipment consists of cars, mining tools, assay office, dwellings, and a 10-stamp mill (modern pattern) run by gasoline; twenty-six men are employed; said to have produced over $350,000; best ore found in pockets; discovered in 1899 by P. Musick, who extracted $80,000 from pockets.

Highland, known also as the *Old Highland.* In Sec. 12, T. 39 N., R. 10 W., in the Salmon River mining district, 12½ miles northwest of Callahan in the Klamath Reserve. Owners, Denny-Bar Company. Comprises 60 acres on Trail Creek; fissure vein between walls of granite and schist, being an extension of the Trail Creek ledge; 200-foot tunnel, and 400 feet of drifts; ore is free and easily worked; idle at present; owners only do assessment work; Trail Creek prospect to the south.

Bibl.: Report XIII, p. 405.

Highland, in Sec. 25, T. 46 N., R. 7 W., in the Cottonwood mining district, 3 miles west of Hornbrook in the Klamath Reserve. Owner,

C. A. Myers. Comprises 60 acres; ore shoot is 125 feet long and 10 inches wide, being free milling and high grade; formation is slate; 1500-foot tunnel on the vein; idle at present; discovered in 1903 by Donnelly Bros.; then abandoned and relocated by Rogers, who abandoned it, and was relocated by present owner; small producer.

Hoboken, in Sec. 21, T. 45 N., R. 8 W., in the Deadwood mining district, 11 miles north of Fort Jones. Owner, T. A. Walker. Comprises 40 acres, patented, on Cherry Creek; 120-foot ore shoot, 10 inches wide, with diabase foot and slate hanging-walls; 600-foot tunnel and 250-foot drift; small producer at one time, the ore being crushed in an arrastra; idle since 1907.

Bibl.: Report XII, p. 284; XIII, p. 406.

Homestake, in Sec. 15, T. 40 N., R. 10 W., in the Klamath Reserve. Owners, Taylor & Bobs; J. F. Boyle, superintendent. Comprises 120 acres on the same lode as the Highland mine; formation is quartz-porphyry and dioritic schist; worked by means of tunnels; high grade (pocket) gold extracted, which has made the property noted; discovered in 1902; elevation is 6100 feet; eight men are employed; has produced several thousand dollars in high grade; 2-mile trail from wagon road.

Humpback, formerly known as *Fagundez,* in Secs. 4, 5, 8 and 9, T. 39 N., R. 11 W., in the Liberty mining district; 3 miles south of Sawyer's Bar in the Klamath Reserve. Comprises 80 acres of patented land on Eddy's Gulch; elevation 3400 feet; length along lode 6000 feet; ore shoot is 80 to 100 feet long and 1 foot wide; strike N. 20° E., dip 25° NE.; formation is slate; workings consist of 250-foot tunnel, drifts and crosscuts; small producer; idle for several years.

Bibl.: Report VIII, p. 619.

Inyo, in Sec. 2, T. 45 N., R. 8 W., in the Humbug mining district, 11 miles west of Yreka in Klamath Reserve at an elevation of 3100 feet. Owner, J. D. Fairchild. Comprises 20 acres, discovered in 1909; short ore shoots in quartz-porphyry pocket mine; produced $4000. Idle. Only do assessment work.

Ironsides, formerly known as *Little Wonder,* in Sec. 26, T. 45 N., R. 8 W., in Greenhorn mining district, 7 miles southwest of Yreka, in Klamath Reserve. Owner, James Ironsides; worked as a pocket mine; three short tunnels; small producer of high grade ore.

Bibl.: Report XII, p. 285; XIII, p. 408.

Johnson and China Paul, in Sec. 12, T. 43 N., R. 10 W., in Quartz Valley mining district, 7 miles north of Greenview. Owner, S. H. Holgate. Comprises 80 acres; 200-foot ore shoot, 10 inches wide, in diabase;

680-foot tunnel; some rich pockets extracted from Johnson claim; idle since 1910.

Bibl.: Report VIII, p. 626.

Kangaroo, in Sec. 29, T. 40 N., R. 7 W., in the Callahan mining district, 9 miles southeast of Callahan in the Klamath Reserve. Owner, C. O. Johnson. Comprises 60 acres; short ore shoot, in diorite and granitic-porphyry, 220-foot tunnel and 400 feet of drifts; worked for pockets; some high grade ore extracted.

Katie May, in Sec. 24, T. 45 N., R. 8 W., in the Greenhorn mining district, 6 miles west of Yreka in Klamath Reserve. Owner, A. S. Calkins; comprises 20 acres; located in 1886; relocated in 1900; short ore shoots in diorite and slate; 250-foot tunnel and 80-foot shaft; one stope, 60 feet by 4 feet by 50 feet; ore in sight consists of 100 tons, valued at $14 per ton; only do assessment work.

Bibl.: Report XIII, p. 409.

King Solomon, in Secs. 6 and 7, T. 38 N., R. 11 W., in the Liberty mining district, 12 miles southeast of Sawyer's Bar in the Klamath Reserve, is another of the quartz producers of Siskiyou County. It is owned by C. B. Cottrell, of Westerly, R. I.; W. H. Young, superintendent, and comprises 40 acres located in the eighties by P. Dannenbrink; length along lode 3000 feet; length of ore shoot, 230 feet; width 5 feet; strike north and south; dip 60° E.; footwall, quartz-porphyry; hanging-wall slate; ore free milling; workings: 130-foot shaft, tunnels, longest being 460 feet, over 1000 feet of drifts, cross-cuts and stopes, making in all several hundred feet of development work; equipment; cars, 30 h.p. boiler, small hoist, dwellings and an 8-stamp mill; has been a good producer and pay ore in sight; five men employed at present; mine being opened up so as to have a considerable tonnage blocked out.

Little Bonsa, in Sec. 9, T. 45 N., R. 7 W., in Hawkinsville mining district, 4½ miles north of Yreka. Owner, C. N. Gordon; in Klamath Reserve; 20 acres, located in 1910; short ore shoot, 6 inches wide; two tunnels, longest 40 feet; idle since 1912.

Lucky Strike, in Sec. 33, T. 41 N., R. 10 W., in the Liberty mining district, 9 miles southeast of Etna Mills in the Klamath Reserve. Owners, Lucky Strike Mining Company, of Los Angeles; president, T. Eagerly; superintendent, W. F. Smith. Comprises 80 acres; short ore shoot in hornblende schist; 450-foot tunnel; some high grade ore found near the surface; two men employed.

Lucky Strike, in Sec. 28, T. 45 N., R. 7 W., in Greenhorn mining district, 1½ miles northwest of Yreka. Owner, F. M. Osgood; superintendent, J. M. Beale; 160 acres, located in 1865; formation, slate; doing

development work; 1000 tons of ore in sight; four tunnels and one 80-foot shaft; nine men employed. Some ore treated in custom mill at Yreka.

Marrian & Goodale, in Sec. 15, T. 40 N., R. 10 W., in the Liberty mining district, 9½ miles southeast of Etna Mills in the Klamath Reserve. Owner, Incorporated Company, of San Francisco; James Hogan, manager; comprises 80 acres, located in 1903; short ore shoot, in hornblende schist; 480-foot tunnel; rich bunches of high grade found; 2-stamp mill driven by steam power; dwellings; has been a small producer; idle at present.

McClaughry Group, in Sec. 8, T. 45 N., R. 8 W., in the Humbug mining district, 14 miles northwest of Yreka in Klamath Reserve. Owner, C. Humphreys; comprises 80 acres; formation is dolomite; 160-foot ore shoot, 2 feet wide; free milling; 600-foot tunnel; ore reserve consists of 1500 tons, assaying $20 per ton. Idle.

Monarch, in Sec. 8, T. 39 N., R. 11 W., in the Liberty mining district. Owner, G. R. Godfrey; comprises 40 acres, on Eddy Creek, at an elevation of 3300 feet; pocket mine; 150-foot tunnel; pockets occur in slate; only do assessment work.

Morrison & Carlock, formerly known as the *Little Queen,* is located in the Quartz Valley mining district, in Sec. 13, T. 43 N., R. 10 W., 4 miles northwest of Greenview, and comprises 60 acres of patented land. It is owned by the Richman Company of Fort Jones and has a production record of $500,000. Idle since 1907 on account of lawsuits. Altitude, 2800 feet; course of vein, N. 20° E, dip 45° E.; vertical depth 400 feet (shaft, size 5′ x 7′); number of levels, eight; 1200-foot drift to the west on this level; walls, limestone and quartz-porphyry; length of ore shoot, 350 feet; width 16 inches; 1500-foot tunnel on vein; character of ore, brittle smoky quartz, free milling; mine equipment: 35 h.p. steam hoist, Gould water pump, cages, dwellings, assay office; reduction equipment: 10-stamp mill built by Union Iron Works, operated by electricity.

Mount Vernon, in Sec. 25, T. 45 N., R. 8 W., in the Greenhorn mining district; 6 miles southwest of Yreka in Klamath Reserve. Owner, Incorporated Eastern Company; ore shoots are 150 feet long and 2 feet wide, occurring in slate; strike N. 40° E.; dip 50° S.; three tunnels, longest being 1200 feet on the vein; equipment; dwellings, assay office and 10-stamp mill driven by electricity, power being obtained by California-Oregon Power Company; has been a producer; worked at times by leasers; idle at present.

Nigger Boy, in Sec. 2, T. 46 N., R. 7 W., in the Cottonwood mining district, 5 miles southwest of Hornbrook in the Klamath Reserve. Owner, W. H. Allison; comprises 60 acres, located in 1898; formation

is slate and diorite; ore shoot is 180 feet long and 2 feet wide; two tunnels, 1000 and 80 feet long on vein; equipment: dwellings, mining tools, blacksmith shop, 2-stamp mill driven by steam and water power; 1½ mile ditch from Ash Creek; under bond to Commercial Copper and Gold Mining Company, of Tallant, Oregon; three men are employed; some production, and ore reserves, claimed.

Ohio Group, in Sec. 8, T. 46 N., R. 6 W., in Fool's Paradise mining district; 7 miles south of Hornbrook. Owner, W. Seeman; 60 acres, patented, located in 1903; formation, syenite and diorite; base ore; 300-foot oreshoot, 1 foot wide; 500-feet tunnel. Idle.

Old Indian, in Sec. 4, T. 9 N., R. 8 E., in Liberty mining district; 9 miles southwest of Forks of Salmon, in Klamath Reserve. Owner, A. Nally; comprises 40 acres, located in 1892; short ore shoot in serpentine; 200-foot tunnel; old 120-foot shaft (caved); worked as a pocket mine; only do assessment work.

Old Vet and Eclipse, in Secs. 10 and 11, T. 45 N., R. 8 W., in the Humbug mining district, 10 miles northwest of Yreka in Klamath Reserve at an elevation of 3900 feet. Owner, J. P. Horn; comprises 40 acres; two parallel veins in granite; three tunnels, longest being 100 feet; few tons of ore milled, gave returns of $14 on plates.

Bibl.: Report XIII, p. 418.

Oregonian Group, formerly known as the *Malloy,* in Secs. 15, 16, 21 and 22, T. 40 N., R. 11 W., in the Liberty mining district; 3 miles northeast of Sawyer's Bar in the Klamath Reserve. Owner, D. Malloy; comprises 60 acres, located in 1886; 160-foot ore shoot 5 feet wide, strike N. 30° E., dip 40° NE.; strong ledge in granite; 420-foot tunnel; only do assessment work.

Bibl.: Report XII, p. 289; XIII, p. 419.

Oro Grande, in Secs. 10 and 11, T. 45 N., R. 7 W., in the Humbug mining district, 12 miles northwest of Yreka in the Klamath Reserve. Owners, Trask & Corinson; comprises 100 acres, located in 1860 and relocated in 1892 by present owners; four parallel veins, having dolomite foot and porphyry hanging-walls; 300-foot ore shoot, 2 feet wide; 300-foot tunnel and 160-foot shaft; one stope 80 feet by 4 feet by 40 feet; 10-foot arrastra run by water from Humbug Creek; owners claim ore reserve of 1000 tons, value $16; produced to date $20,000; some of the ore pans $40 per ton; owners do all the work.

Bibl.: Report, XIII, p. 419.

Overton, in Sec. 16, T. 40 N., R. 10 W., in the Liberty mining district; 13 miles southeast of Etna Mills in the Klamath Reserve. Owners, Overton Gold Mining Company; C. E. Overton, president;

L. E. Buckner, superintendent; comprises 80 acres; ore shoots are 100 feet long and 20 inches wide, in dioritic schist; 420-foot tunnel, drifts and stope; 120 tons of ore on the dump, which is carried on mules to the Advance mill, a distance of 2 miles (5 mules handle 1 ton each trip, or 8 tons per day); property is idle at present; small producer.

Pilot Knob, in Secs. 23, 24 and 26, T. 47 N., R. 7 W., in the Virginia Bar mining district, 3 miles north of Gottville in Klamath Reserve. Owners, Pilot Knob Mining Company; president, W. D. Wall; secretary and superintendent, T. K. Anderson; home office, Gottville; comprises 310 acres; formation, hornblende schist; three veins; length and width of ore body not determined; crosscut tunnel 340 feet long, not in ore as yet; several small tunnels in ore; ore is free milling and runs $20 per ton; equipment consists of assay office, several dwellings, 600 feet of aerial tramway; 5-stamp Risdon Iron Works mill (850-pound stamps) run by water power; two men employed; last ore milled gave returns of $18 per ton from 16 tons; located in 1882.

Prospect Hill, in Sec. 30, T. 12 N., R. 6 E., 11 miles from Orleans in the Cottage Grove mining district in Klamath Reserve. Owners, C. S. Little; several small tunnels in porphyry; free milling, 3-stamp mill; small production.

Providence, in Sec. 18, T. 43 N., R. 9 W., in the Oro Fino mining district, 5 miles northeast of Greenview. Owners, Kradel Brothers; comprises 40 acres; short ore shoot in diabase; worked for pockets; 650-foot tunnel; small producer. Idle; only do assessment work.

Bibl.: Report XIII, p. 421.

Quartz Hill, in Sec. 16, T. 45 N., R. 10 W., in the Scott River mining district, $\frac{1}{8}$ mile south of Scott Bar on Scott River in Klamath Reserve. Owner, H. G. Noonan, of San Francisco; comprises 45 acres of patented land on Quartz Hill, located in 1862; ore occurs in slate, and has been worked both as a quartz and hydraulic mine, the surface having been worked as a placer deposit at one time; water is obtained from Mill Creek through two ditches, one 6 miles and the other 5 miles in length; the strike is northeast and southwest; the bedrock, so-called, consists of alternate beds of slate and quartzite, enclosed by two parallel dikes, 1800 feet apart. The whole mass is crushed by these dikes of quartzite; practically only the surface has been worked; yearly production is from $10,000 to $12,000; equipment consists of old 10-stamp mill, two giants, and 1500 feet of pipe; some rich pockets found in the quartz seams. Idle at present.

Bibl.: Report XII, p. 290; XIII, p. 421.

Red Hill, in Sec. 4, T. 45 N., R. 7 W., in the Hawkinsville mining district; 5 miles north of Yreka. Owner, J. Phillips; in Klamath

Reserve; 13-inch vein; free milling; 40 acres, located in 1903; three tunnels, one 304 feet long; formation quartz-porphyry; ore treated in custom mill at Yreka. Produced $6,000.

Reeder Group, in Sec. 8, T. 46 N., R. 7 W., in Fool's Paradise mining district; 6½ miles south of Hornbrook. Owner, B. C. Reeder; 120 acres, located in 1875; formation slate; three tunnels, longest 250 feet; rich pockets taken out on Bonanza claim, largest being $20,000; said to have produced $50,000 to date; owner works claims.

Robinson Gulch, in Sec. 18, T. 40 N., R. 10 W., in the Liberty mining district, 14 miles southeast of Etna Mills at an elevation of 5400 feet. Owners, Robinson Gulch Mining Company, of Etna Mills; C. M. Chase, president; A. A. Dyer, superintendent; comprises 80 acres, located in 1903; short ore shoot in hornblende schist; 100-foot tunnel; only do assessment work; small pocket discovered on the surface.

Rough & Frye, in Sec. 30, T. 12 N., R. 6 E., 11½ miles from Orleans, in the Cottage Grove mining district in Klamath Reserve. Owner, C. Frye; 40 acres located in 1913; 175-foot tunnel and open cuts on surface for 600 feet; vein is 11 feet wide; free milling; some ore runs $15 per ton; doing development work.

Ruby Basin, formerly known as the *Jumbo,* in Sec. 36, T. 40 N., R. 11 W., in the Liberty mining district; 4 miles east of Sawyer's Bar in the Klamath Reserve. Owner, I. Cullberg, Jr., of Arcata; comprises 100 acres on White's Gulch; 160-foot ore shoot; free milling, 3 feet wide, north and south strike and dip 40° E.; in slate; 800-foot tunnel, 500 feet of drifts and 60-foot stope; old 10-stamp mill, driven by water power; small producer at one time. Idle at present.

Saint Lawrence, in Sec. 12, T. 43 N., R. 10 W., in the Quartz Valley mining district, 6 miles north of Greenview. Owner, A. G. Myers; comprises 20 acres; pockets in the quartz-porphyry; 220-foot tunnel. Idle.

Skelton, in Sec. 26, T. 41 N., R. 9 W., in the Liberty mining district, 5 miles southeast of Etna Mills in the Klamath Reserve. Owner, D. Skelton; comprises 20 acres, located in 1893; 130-foot vein, 4 feet wide, but base in character and probably too low grade to pay to work, as it only carries $3 in gold per ton, 2% copper and a little silver. Idle at present.

Specimen, in Sec. 15, T. 40 N., R. 9 W., in the Callahan mining district, 5 miles west of Callahan in the Klamath Reserve. Owner, W. Ellis; comprises 60 acres, on Craig's Gulch; short ore shoot in hornblende schist; worked for pockets, and some rich specimens extracted; 150-foot tunnel. Idle at present.

Bibl.: Report XIII, p. 427.

Star, in Sec. 12, T. 43 N., R. 10 W., in the Quartz Valley mining district, 6 miles north of Greenview. Owner, F. Star; comprises 20 acres, located in 1882; pockets in the quartz porphyry; 700-foot tunnel. Idle.

Sterling, in Sec. 20, T. 42 N., R. 8 W., in the Deadwood mining district, 13 miles northwest of Fort Jones at an elevation of 7300 feet. Owner, W. Crocker; comprises 40 acres on east fork of Deadwood Creek; short ore shoot in slate and diabase; worked for pockets; some rich ore extracted; 620-foot tunnel; only do assessment work.

Bbl.: Report XIII, p. 428.

Sundown, in Sec. 19, T. 47 N., R. 7 W., in Virginia Bar mining district, 4 miles north of Gottville in Klamath Reserve. Owners, Denver Mining Company, C. A. Von, president; home office, Denver, Colorado; comprises 60 acres; formation, diorite and schist; ore shoot 100 to 120 feet long, 2 feet wide; two tunnels, 150 and 800 feet long; 5-stamp mill driven by water power; 1 mile ditch from Dutch Creek; small production. Idle.

Taft, in Sec. 30, T. 11 N., R. 8 E., in Liberty mining district, 9 miles northeast of Forks of Salmon by trail; in Klamath Reserve; at an elevation of 2800 feet. Owner, C. Taylor; comprises 40 acres, located in 1908; pocket gold in slate; 100-foot tunnel; small production. Idle.

Teddy-Avalon, in Sec. 18, T. 47 N., R. 7 W., in Virginia Bar mining district, 7 miles north of Gottville in Klamath Reserve. Owner, E. J. Durkee; comprises 40 acres; formation is granite; short ore shoot, 1 foot wide; 125-foot tunnel; little high grade taken out; free milling.

Trail Creek, in Sec. 12, T. 39 N., R. 10 W., in the Salmon River mining district, 12 miles west of Callahan in the Klamath Reserve. Owner, Trail Creek Mining Company, of Callahan; George A. Foster, president and superintendent; George Hart, secretary; comprises 100 acres on Trail Creek at an elevation of 7200 feet, reached by trail from Callahan. The fissure vein occurs between schist walls, with a strike of N. 40° W., and a dip of 60° N.; ore shoot is 300 feet long and 2 feet wide; workings consist of an 850-foot tunnel, several small drifts and a stope 200 feet in length; equipment consists of two 3½-foot Huntington mills (capacity is 20 tons in twenty-four hours, through 50-mesh screen) run by waterpower; tools, ore cars and dwellings; seven men are employed; owner claims an ore reserve of 3000 tons of rock; free milling; yearly production 1912 (seventy days' run) was $15,000; production to date $40,000; best prospect in the district.

Twan & Hannan, in Sec. 30, T. 12 N., R. 6 E., 11 miles from Orleans in the Cottage Grove mining district in Klamath Reserve.

Owners, Twan & Hannan; comprises 40 acres; 400-foot crosscut tunnel, in porphyry; only do assessment work; ledge 4 feet wide on the surface; some ore crushed and treated in cyanide mill at Champion.

Uncle Sam Consolidated, formerly known as the *Sheffield,* in Secs. 3 and 10, T. 39 N., R. 11 W., in the Liberty mining district, 7 miles south of Sawyer's Bar in the Klamath Forest Reserve. Owners, Sheffield Estate; comprises 60 acres between White and Eddy gulches, located in 1873. Length along the lode, 3000 feet; length of ore shoot, 110 feet, and width 2 feet; vertical depth below outcrop, 300 feet; strike N. 20° E., dip 25° NE.; footwall, slate; hanging wall, quartz-porphyry; length driven on vein, 420 feet; ore free milling; water supply from White's Gulch through 1½ miles of ditch and ½ mile of flume; old workings consisting of stopes and drifts are caved; equipment consists of dwellings and old 8-stamp mill, 780-pound stamps; producer for several years; some good ore in workings. Idle at present.

Bibl.: Report VIII, p. 619; XI, p. 433; XII, p. 293; XIII, p. 431.

Wicks, in Sec. 13, T. 44 N., R. 10 W., in the Deadwood mining district, 12 miles northwest of Fort Jones at an elevation of 6200 feet. Owner, Weeks Bros.; comprises 40 acres; short ore shoot in diabase, badly faulted; little high grade extracted on the surface; 150-foot tunnel. Idle.

White Bear, in Sec. 13, T. 39 N., R. 12 W., in the Liberty mining district, 9 miles southwest of Sawyer's Bar in the Klamath Reserve. Owners, Daggett & Smith; comprises 20 acres, north of the Black Bear, on an east and west vein; ore shoot is 100 feet long and 2 feet wide, with a dip of 30° E.; 400-foot tunnel and 2 drifts, each 80 feet in length; equipment: dwelling and 5-stamp mill; good prospect, but only small amount of development work; owners expect to employ several men during the winter. One man at work at present.

Zarina, in Sec. 33, T. 41 N., R. 10 W., in the Liberty mining district, 9½ miles southeast of Etna Mills in the Klamath Reserve. Owners, Zarina Mining Company, of Etna Mills; J. W. Harris, superintendent; comprises 100 acres, located in 1900; elevation, 6500 feet; ore shoot, 130 feet long and 2 feet wide; dioritic schist walls; 350 and 80-foot tunnels, drifts and stopes; equipment consists of dwellings and 5-stamp mill, driven by water power from lake above the property; small producer; not worked on any scale since 1911. One man employed at present; best ore found in pockets, similar to the Highland.

GOLD MINES—PLACER.

A succession of terraces or benches of considerable width covered with trees and shrubbery and containing auriferous gravel banks, which range from 50 to 200 feet in height, are frequent along the Klamath River and its tributaries. These benches are often miles in extent, being frequently cut by the more modern and deeper channels, and were probably formed by glacial action, causing the river to seek a new channel, for the rim rocks are intact and sharply defined and were not worn away gradually. These old gravel channels have played an important part in the mining production of this county.

An important change has taken place at the junction of the Scott River with Klamath, for here are found terraces or benches, usually three in number, with well defined trough-shaped depressions, rims intact, receding and ascending gradually from the river bed or its banks and forming a series of steps from 200 to 300 feet apart and from 50 to 200 feet between respective channels. These are evidently the old river courses, buried in places 100 feet deep under the rocky debris that had slid from the mountain side during a cataclysm of nature, causing new channels cutting deeper into the rocky formation, to be formed. These deposits have been worked by both drift and hydraulic mining.

Approximate production of placer mines, along the Klamath River from Humbug Creek to Scott River (from a known area):

Name of property	Size of ground worked			Number of cubic yards	Value taken out	Average per cubic yard
	Length in feet	Width in feet	Depth in feet			
Virginia Bar	100	50	10	1,851	$30,000	$16 20
M. Mott, at head of Virginia Bar	50	16	10	296	8,000	27 00
Centennial	685	40	40	40,000	97,000	2 42
Manzanita Bar	1,600	200	25	296,296	300,000	1 01
Yankee Dam	100	60	4	888	13,000	14 62
Vatinell & Co.	150	50	6	1,666	8,000	4 80
Pierson & Co. below Oak Bar	150	20	3	836	7,300	8 72
Poverty Point drift mine	1,500	30	6	10,000	23,000	2 36
Maplesden wing dam	150	30	30	5,000	30,000	6 00
Daggett	200	50	5	1,851	25,000	13 50
Kols wing dam	60	30	6	400	1,100	2 75

Portuguese Company, at Oak Bar, took out, with eleven men and use of derrick, in three days, by hand shoveling, $3000, or at rate of $1000 per day.

China Sam took out in one tub, or 5 cubic yards, 8 ounces of gold, valued at $134.

Wm. McConnell's claim, Humbug Creek, took out in one season, $34,000; same claim, next season, $28,000; same claim, next season, $22,000; total, $84,000; pick and shovel, and use of derrick, from one acre.

Daggett Mine, worked with pick and shovel, with four men, averaged $100 per day for several months.

From Pine Grove Mine, from a pit 100 feet square, on bedrock, and 18 feet deep, $6,000 was extracted.

GOLD MINES—HYDRAULIC.

Bark House Creek, in Secs. 23 and 26, in Oak Bar mining district, 26 miles west of Hornbrook in Klamath Reserve. Owners, N. E. and P. C. Lange; comprises 200 acres; micaceous schist bedrock; coarse gold found in crevices of bedrock; good producer years ago. Idle at present.

Beaudry, in Secs. 3, 11, 34, 35, 30, 26, 2 and 23, T. 39 and 40 N., R. 8 and 9 W., in the Callahan mining district, 1 mile southeast of Callahan in the Klamath Reserve is the best paying hydraulic mine in this district. Owner, J. Beaudry; comprises several of the old placer locations, with an area of 640 acres on Scott River and Wildcat Creek; the bedrock is schist; gravel 20 to 60 feet deep; water is obtained from South Fork of Scott River and Wildcat Creek through two ditches, one 15 and the other 2 miles in length; 7 giants, 4000 feet of pipe and three dwellings on the property; six men employed at present making repairs to ditches; use fifteen men during the season; production said to be from $25,000 to $40,000 per year.

Belle Josephine, formerly known as *Slide Creek,* in Sec. 14, T. 39 N., R. 9 W., in the Callahan mining district, 6 miles southwest of Callahan in the Klamath Reserve. Owner, A. E. Westover; comprises 160 acres, on Slide Creek, including the Abers, Carter and other old placer mines, which have been noted producers; schist bedrock; 30 to 50 feet of gravel; water from Slide Creek through a ditch 2 miles long, carrying 1100 inches; equipment consists of four giants, 2500 feet of pipe and two dwellings; twelve men employed during operating season, but only three men at present. Cost about $1500 per year for ditch repairs; property is paying dividends.

Bloomer, in Secs. 33 and 34, T. 11 N., R. 7 E., in the Liberty mining district, 6 miles northwest of Forks of Salmon in the Klamath Reserve. Owners, Bennett Company; comprises 51 acres of patented land; bedrock is schist; worked extensively years ago and was good producer. Idle.

Bibl.: Report VIII, p. 612; XII, p. 278; XIII, p. 390.

Blue Gravel, formerly known as the *Black Lead,* in Sec. 32, T. 45 N., R. 7 W., in the Greenhorn mining district, 2 miles south of Yreka in Klamath Reserve. Owners, Smith & Lee; comprises 200 acres, located in 1888; it was a famous placer producer at one time; slate bedrock;

10 feet of gravel; about 60 acres have been worked. Idle since 1910; has been drilled for dredging ground.

Bibl.: Report XIII, p. 390.

Blue Hill, in Sec. 16, T. 45 N., R. 10 W., in the Scott Bar mining district, ⅛ mile south of Scott Bar in the Klamath Reserve. Owner, E. Jacobs; comprises 20 acres, along Scott River; slate bedrock; 20 to 40 feet gravel; water from Mill Creek through a ditch ½ mile long; equipment one giant and 1000 feet of pipe; worked on a small scale. Idle on account of lack of water.

Bowersox, in Sec. 2, T. 11 N., R. 7 E., in the Liberty mining district at Somes Bar in Klamath Reserve. Owner, W. P. Bowersox; comprises 40 acres; schist bedrock; 20 feet of gravel. Idle; only worked to limited extent.

Brown & George, in Sec. 1, T. 38 N., R. 11 W., in the Liberty mining district, 14 miles southeast of Sawyer's Bar in the Klamath Reserve. Owners, Banner Mining Company; T. H. George, superintendent; comprises 40 acres on Shattuck Creek; schist bedrock; 10 to 40 feet of gravel; two giants and 1000 feet of pipe. Idle.

Bibl.: Report XIII, p. 391.

Campbell, in Secs. 1, 2, 11, 12, 13 and 14, T. 43 N., R. 10 W., in the Quartz Valley mining district, 6 miles north of Greenview. Owners, Weed & Gardner; holdings comprise 1500 acres of patented land, being practically all the placer ground in this district, and includes the old Hull Gulch, Sucker Flat, Smith & Hand, Van Duzen Gulch and Meads Gulch properties; bedrock is quartz-porphyry; gravel from 20 to 80 feet deep; water from Kidder and Shackleford creeks, through two ditches, one 14 and the other 5 miles long; equipment consists of three giants, and 3000 feet of pipe. Idle since 1910; some rich gravel; at one time a large production was obtained from these mines.

Bibl.: Report XII, p. 279; XIII, p. 392.

Cecilville, formerly known as the *Sightman,* in Sec. 30, T. 38 N., R. 11 W., in the Liberty mining district, 15 miles southeast of Sawyer's Bar in the Klamath Forest Reserve. Owner, G. H. Sightman; comprises 40 acres on Crawford Creek; schist bedrock; 20 to 60 feet of gravel; water from Crawford Creek through 2½-mile ditch; one giant and 800 feet of pipe; only worked on a limited scale during the winter; small producer.

China Creek, formerly known as the *Reeves,* in Sec. 5, T. 16 N., R. 7 E., in the Happy Camp mining district, 6 miles northeast of Happy Camp in the Klamath Forest Reserve. Owner, Chinese Company; com-

prises 40 acres of patented land; schist bedrock; 10 to 40 feet of gravel. Idle several years; good producer in the past.

Bibl.: Report XIII, p. 393.

Classic Hill, in Sec. 36, T. 18 N., R. 6 E., in the Happy Camp mining district, 12 miles north of Happy Camp in the Klamath Forest Reserve. Owner, C. Wheeler; comprises 43 acres of patented land; schist bedrock; 5 to 30 feet of gravel; water from west branch of Indian Creek through a ditch 5 miles long, carrying 600 inches; equipment consists of two giants and 1000 feet of pipe; has been a good producer. Idle.

Bibl.: Report XIII, p. 394.

Crapo, in Sec. 11, T. 10 N., R. 7 E., 3 miles southwest of Forks of Salmon in Klamath Forest Reserve. Owners, Bennett Company; comprises 39 acres of patented ground; slate bedrock; 20 feet of gravel. Idle.

Bibl.: Report VIII, p. 612; XII, pp. 280, 282; XIII, p. 396.

Cronin, in Sec. 22, T. 40 N., R. 12 W., in the Liberty mining district, 7 miles west of Sawyer's Bar in the Klamath Forest Reserve. Owner, French Syndicate of Paris, France; J. Sapp, watchman; comprises 40 acres, patented, on West Fork of Salmon River; slate bedrock; 30 to 100 feet of gravel; water from Boulder Gulch through 2-mile ditch carrying 800 inches; 5 giants, 3000 feet of pipe, derrick and dwellings; good producer at one time. Idle since 1910.

Bibl.: Report XIII, p. 396.

Davis, formerly known as the *Van Brunt,* in Sec. 11, T. 16 N., R. 7 E., in the Happy Camp mining district; $\frac{1}{8}$ mile southwest of Happy Camp, was located in 1870 and has been worked since that time. It is owned by R. A. Davis, of San Francisco, and comprises 200 acres of patented land along the Klamath River; the bedrock is schist and the gravel in places is more than 100 feet deep. Water is obtained from the South Fork of Indian Creek, through a ditch 10 miles long, having a capacity of 120 inches and which cost $40,000; equipment consists of three giants, sluice boxes and 2000 feet of pipe; twelve men employed during operating season; cost of operating about $10,000 (period of five months); pays dividends; small amount of platinum obtained. (See photo No. 3.)

Denny, in Secs. 17, 20, 21 and 29, T. 40 N., R. 8 W., in the Callahan mining district, in town of Callahan, in the Klamath Reserve. Owners, Scott River Dredge Company; comprises 400 acres of old locations along the Scott River, 118 acres of which is patented; schist bedrock; 20 to 60 feet of gravel, some boulders and some cement near the bedrock; 3-mile ditch from South Fork of Scott River; ground

Photo No. 3. Davis hydraulic mine—Happy Camp.

noted placer producer in the early days; company endeavored to work the bed of Scott River with a small dredge, but did not understand this business and dismantled the boat in 1910 and sold the machinery; property idle since that time; some good ground yet to be worked.

Dick Morris, formerly known as the *Ramis,* in Sec. 35, T. 46 N., R. 11 W., in the Hamburg Bar mining district, 1¾ miles northwest of Hamburg Bar in the Klamath Reserve. Owners, Johnson & Hanses; comprises 40 acres; schist bedrock; 10 to 30 feet of gravel; two giants and 500 feet of pipe. Idle. Adjoins Hammer on the north.

Dunnigan, in Sec. 20, T. 12 N., R. 6 E., in the T-Bar mining district, 36 miles (by trail) south of Happy Camp in the Klamath Forest Reserve. Owners, Dunnigan Consolidated Mining Company, of San Francisco; E. M. Wilbur, president; Mrs. E. J. Wilbur, secretary; J. M. Stickel, general manager; holdings comprise 160 acres, consisting of old benches; portion of land worked in the early days and relocated by J. M. Stickel in 1912; water obtained from T-Bar Creek through ditch ¼ mile long; bedrock in serpentine and slate; depth of gravel from 10 to 40 feet (loose); equipment consists of two giants, 2000 feet of pipe, dwelling and sluice boxes; one man employed at present; company intends to work a full crew in the spring; said to be good ground.

Eastlick, in Secs. 17 and 18, T. 43 N., R. 9 W., in the Oro Fino mining district, 5 miles northeast of Greenview. Owners, Richman & Beems, of Fort Jones; comprises 67 acres of patented land; bedrock is quartz-porphyry; 30 to 60 feet of gravel; two ditches from Mill and Kidder creeks, one 6 miles and the other 4 miles long; equipment consists of three giants and 2600 feet of pipe; noted property at one time and yielded good returns. Idle for past three years.

Bibl.: Report VIII, p. 608; XII, p. 281; XIII, p. 398.

Elliott, formerly known as the *Golden Nugget,* in Sec. 20, T. 40 N., R. 11 W., in the Liberty mining district, ¾ mile north of Sawyer's Bar in the Klamath Forest Reserve. Owner, M. L. Elliott; comprises 20 acres, patented, on Jackass Gulch; slate bedrock; 15 to 40 feet of gravel; two giants, 1000 feet of pipe and derrick; water from Jackass Gulch through a flume 1½ miles long; good production in 1911; coarse gold on bedrock; worked in winter.

Bibl.: Report VIII, p. 603.

Ellston, in Sec. 33, T. 11 N., R. 7 E., in the Liberty mining district, 10 miles northwest of Forks of Salmon in Klamath Forest Reserve. Owner, A. E. Ellston; comprises 30 acres; slate bedrock; 20 feet of gravel. Idle; only does assessment work; some rich gravel worked years ago.

Espey, in Sec. 25, T. 47 N., R. 9 W., in the Oak Bar mining district, 30 miles northwest of Hornbrook. Owners, Espey Mining Company; home office, Seattle, Wash.; in Klamath Reserve; 50 acres of ground; bedrock is schist. Idle on account of lack of water.

Fir Tree, in Secs. 19 and 20, T. 10 N., R. 8 E., in the Liberty mining district, 1 mile southeast of Forks of Salmon in Klamath Forest Reserve. Owners, Bennett Company; comprises 20 acres of patented ground; schist bedrock; 10 feet of gravel; 2½-mile ditch from Salmon River. Idle; has not been worked for several years.

Forks, formerly known as *McNeals,* in Sec. 13, T. 10 N., R. 7 E., in the Liberty mining district, in town of Forks of Salmon in the Klamath Forest Reserve. Owners, Bennett Company; comprises 50 acres; schist bedrock; 20 feet of gravel. Idle; under option to the La Grange Mining Company; some rich gravel.

Bibl.: Report XII, p. 287; XIII, p. 401.

Forks of Salmon River, in Secs. 16, 17, 18, 13, 7, 8 and 9, T. 10 N., R. 7 and 8 E., in the Liberty mining district, 1½ miles northeast of Forks of Salmon in the Klamath Forest Reserve, is the largest hydraulic

Photo No. 4—Dam—Forks of Salmon River Mining Company.

mine in this district. It is owned by the Forks of Salmon River Mining Company, of San Francisco; F. Salvage, president; V. G. Bonaly, secretary, and M. A. Singer, superintendent. The holdings comprise 520 acres of old placer locations, which were rich diggings in the early days. This company controls some 4 miles of the old channels and bars along the North Fork of Salmon River. The bedrock is schist, with 20 to 60 feet of gravel covering the same; only about 3 acres of ground have been worked. Water is obtained from the North Fork of the Salmon River through a ditch carrying 3800 inches, having a length of 4 miles and a 50-foot pressed overflow dam impounds the water at the intake. The equipment consists of five giants, machine shop, small electrical plant, pipe, derricks, and dwellings; sixteen men at $3 per day are employed. In 1911 and 1912, the yearly production exceeded $60,000; has produced over $200,000 since 1908.

Fort Goff, in Sec. 31, T. 47 N., R. 12 W., in the Seiad mining district, 14 miles west of Hamburg Bar in the Klamath Reserve. Owner, G. Martin; comprises 80 acres of patented land along the Klamath River; schist bedrock; 10 to 60 feet of loose gravel; water obtained from Fort Goff Creek through a ditch 1½ miles long carrying 800 inches; equipment consists of two giants and 3100 feet of pipe; has not been worked since 1911; some good ground; small producer.

Bibl.: Report VIII, p. 596; XII, p. 283; XIII, p. 401.

Gardner and Deming, in Secs. 7 and 18, T. 43 N., R. 9 W., in the Oro Fino mining district, 5½ miles northeast of Greenview. Owners, Weed & Gardner; comprises 150 acres of patented land; bedrock is quartz-porphyry with quartz stringers running through it; 10 to 50 feet of gravel. Idle.

Bibl.; Report XIII, p. 402.

Geeshan and Kellner, in Sec. 30, T. 40 N., R. 11 W., in the Liberty mining district, 2 miles west of Sawyer's Bar in the Klamath Reserve. Owners, Geeshan & Kellner; comprises 20 acres on the Klamath River; slate bedrock; 50 feet of gravel; water from North Fork of Salmon River through 1½-mile flume; one giant, 1200 feet of pipe and derrick; has been a good producer; worked on a small scale during the winter.

Gold Hill, in Secs. 28 and 29, T. 40 N., R. 11 W., in the Liberty mining district, in town of Sawyer's Bar in the Klamath Reserve. Owners, G. W. and O. R. Bigelow; comprises 80 acres on North Fork of Salmon River; slate bedrock; 10 to 80 feet of gravel; water from Eddy's Gulch through 2 miles of ditch; three giants, 1200 feet of pipe and hand derrick; good producer; operated during the winter when water is plentiful.

Gordan, in Sec. 17, T. 18 N., R. 7 E., in the Happy Camp mining district, 5 miles northeast of Happy Camp in Klamath Reserve. Owner,

C. Gordan; comprises 60 acres; schist bedrock; 30 feet of gravel; three men employed during operating season; yearly production about $4000.

Bibl.: Report XII, p. 283; XIII, p. 403.

Grider, in Secs. 12, 15, 10, 14 and 11, T. 46 N., R. 12 W., in the Seiad mining district, 9 miles southwest of Hamburg Bar in Klamath Reserve. Owner, J. B. Grider; comprises 245 acres, patented; on the Klamath River; schist bedrock; 10 to 40 feet of gravel; water from Grider Creek through 3-mile ditch of a capacity of 240 inches; equipment consists of dwellings, two giants and 1500 feet of pipe; operating season from four to five months; average production monthly of $2000. Idle at present on account of lack of water.

Bibl.: Report VIII, p. 600; XIII, p. 403.

Haley, formerly known as the *Halstead,* in Sec. 7, T. 16 N., R. 7 E., in the Happy Camp mining district, 10 miles southwest of Happy Camp in Klamath Reserve. Owner, M. Doolittle; comprises 40 acres of patented land; schist bedrock; 10 to 30 feet of gravel; some boulders and some cement. Idle for several years.

Bibl.; Report VIII, p. 601; XIII, p. 404.

Hammer, in Secs. 36, 1 and 4, T. 46 N., R. 11 W., in the Hamburg Bar mining district, ½ mile west of Hamburg Bar in the Klamath Forest Reserve. Owners, Johnson & Caldwell; comprises 60 acres along the Klamath River; schist bedrock; 30 to 40 feet of gravel; water from Kuntz and Mill creeks through a 3-mile ditch; four giants, 1000 feet of pipe, and dwelling; property leased; worked one month in 1913 and produced $400; some good ground. Idle at present.

Happy Home, formerly known as the Maplesden, in Sec. 31, T. 46 N., R. 10 W., in the Hamburg Bar mining district in the Klamath Forest Reserve, ¼ mile east of Hamburg Bar. Owner, Maplesden Brothers; comprises 40 acres on the Klamath River; schist bedrock; large portion of this ground has been worked; good pay on bedrock; two men are employed cleaning up the sluice boxes.

Bibl.: Report VIII, p. 594.

Hardscrabble, in Secs. 1 and 12, T. 44 N., R. 9 W., in the Deadwood mining district, 6 miles north of Fort Jones. Owner, J. D. Duane; comprises 20 acres, patented, on McAdams Creek; quartz-porphyry bedrock; 30 to 50 feet of gravel; water from McAdams Creek through a ditch 2 miles long; rich diggings years ago, worked by Chinese. Idle at present.

Bibl.: Report XIII, p. 404.

Hickey, in Secs. 24 and 25, T. 40 N., R. 12 W., in the Liberty mining district, 2 miles west of Sawyer's Bar in the Klamath Forest Reserve. Owners, Pike & Hickey; comprises 20 acres, patented, on North Fork of Salmon River; slate bedrock; 25 to 70 feet of gravel; water from North Fork of Salmon River through 3-mile ditch. Idle in 1913; small producer when operated.

Bibl.: Report XIII, p. 405.

Hi You, in Sec. 29, T. 44 N., R. 8 W., in the Deadwood mining district, 8 miles north of Fort Jones. Owners, Wyman and Richman; comprises 40 acres, patented, on Deadwood Creek; quartz-porphyry bedrock; 30 to 50 feet of gravel; water from Deadwood Creek through a ditch 1¼ miles long; two giants and 2000 feet of pipe; only worked a few times since 1905; good producer years ago.

Bibl.: Report XIII, p. 405.

Hooper Hill, formerly known as *Preckel,* in Sec. 21, T. 45 N., R. 10 W., in the Scott Bar mining district, ½ mile southeast of Scott Bar in the Klamath Reserve. Owner, H. Preckel; comprises 20 acres along Scott River; slate bedrock; 20 feet of gravel; water from Pat Ford Creek through 1 mile of ditch; equipment: one giant, 1100 feet of pipe and dwelling; worked on a small scale. Idle on account of lack of water.

Hoosier Hill, in Sec. 36, T. 46 N., R. 11 W., in the Hamburg Bar mining district, ½ mile west of Hamburg Bar in the Klamath Forest Reserve. Owner, C. L. Willard; comprises 32 acres of patented ground, located in 1856; bedrock is schist; 20 to 50 feet of gravel; two giants and 800 feet of pipe; rich ground worked years ago; leased, and only short season in 1913 due to shortage of water; small production.

Huey Hill, in Sec. 25, T. 18 N., R. 6 E., in the Happy Camp Mining district, 14 miles north of Happy Camp in Klamath Forest Reserve. Owner, D. Huey; comprises 40 acres, patented; schist bedrock; 20 feet of gravel; two giants and pipe; only worked in a limited way; small producer; some good gravel.

Bibl.: Report XIII, p. 407.

Imperial Heights, in Sec. 33, T. 40 N., R. 11 W., in the Liberty mining district, 2 miles south of Sawyer's Bar in the Klamath Forest Reserve. Owner, Ed Hickey; comprises 40 acres on North Fork of Salmon River; slate bedrock; 20 to 80 feet of gravel; water from Shellatoe Gulch through 2-mile ditch; 2 giants, 1700 feet of pipe and derrick; operated during the winter; small producer.

Jack Lowden, in Sec. 13, T. 46 N., R. 12 W., in the Seiad mining district, 10 miles west of Hamburg Bar in the Klamath Reserve. Owner, J. S. Lowden; comprises 140 acres of patented land along the Klamath River; slate bedrock; 5 to 40 feet of gravel; water from

Walker Creek through 2½-mile ditch of 1500 inches capacity; one giant and 2500 feet of pipe; four to five month operating season; good ground.

Joe Ramus, in Sec. 6, T. 45 N., R. 10 W., in the Scott Bar mining district, 3 miles north of Scott Bar, on Scott River in the Klamath Forest Reserve. Owner, G. A. Milne; comprises 60 acres; slate bedrock; 20 feet of gravel; water from Tom Creek; through 2½ miles of ditch; equipment: two giants and 1000 feet of pipe; yearly production about $7500; worked years ago by rocker and said to have produced $500,000; two men employed at present; idle on account of lack of water; some good ground.

Klein, formerly known as the *Casey,* in Sec. 4, T. 39 N., R. 11 W., in the Liberty mining district, 2½ miles south of Sawyer's Bar in the Klamath Forest Reserve. Owner, Woodfill & Luddy; comprises 50 acres; slate bedrock; 30 feet of gravel; water from Eddy's Gulch through ½ mile of ditch; one giant and 500 feet of pipe; worked on a small scale during the winter; small producer.

Bibl.: Report XII, p. 286; XIII, p. 411.

Lowden, formerly known as *McCreary,* in Secs. 2 and 35, T. 45 and 46 N., R. 11 W., in the Hamburg mining district, ½ mile south of Hamburg Bar in the Klamath Forest Reserve. Owner, J. S. Lowden; comprises 60 acres, 20 of which are patented, and follows the course of the Klamath River; schist bedrock; 10 to 40 feet of gravel; water from Tom Creek through a ditch 2 miles long; two giants and 1000 feet of pipe; worked on a small scale; idle on account of scarcity of water.

Bibl.: Report XII, p. 286; XIII, p. 413.

McGuffey, in Sec. 16, T. 45 N., R. 10 W., in the Scott River mining district, in town of Scott Bar in Klamath Forest Reserve. Owner, T. G. McGuffey; comprises 40 acres, on Scott River, located in 1873; slate bedrock; 20 to 40 feet of gravel; equipment consists of two giants, and 600 feet of pipe; worked on a small scale; has been a good producer.

Bibl.: Report XII, p. 287; XIII, p. 415.

Michigan-Salmon, formerly known as the *Red Hill,* in Secs. 19, 20, 21 and 28, T. 10 N., R. 8 E., 1½ miles east of Forks of Salmon in the Klamath Forest Reserve, is one of the noted hydraulic mines in the Liberty district, and comprises 600 acres, 40 of which are patented. It is owned by the Michigan-Salmon Mining Company of Detroit, Mich.; president, S. Stevens; secretary, George Whitworth; superintendent, L. E. Taggett. These holdings, extending along the Salmon River for a distance of 2½ miles, consisting of old river bars and benches, include the well known Red Hill, Missouri Bar, Cash, Clovis and Rocky Bar placers, which were good producers during pioneer mining days. The

general course of the channel is southwest; depth of gravel 20 feet; bedrock consists of slate and schist; about 60 acres have been worked; water is obtained from Knownothing Creek through 1 mile of ditch and 3 miles of flume, having a capacity of 40 inches; the equipment consists of two Ruble elevators (which are 90 feet long, 8½ feet wide and pitch at an angle of 17°), dwellings, three giants, pipe, etc.; six men employed continually and twelve during operating season of seven months; operating cost about $12,000 per year; good profit made from operations.

Bibl.: Report VIII, p. 615; XII, p. 290; XIII, p. 422.

Milich, in Sec. 2, T. 10 N., R. 7 E., in the Liberty mining district, 5 miles northwest of Forks of Salmon. Owner, P. Milich; comprises 20 acres; schist bedrock; 30 feet of gravel; water from Crapo Creek through 1½-mile ditch. Idle since 1911.

Bibl.: Report XII, p. 288; XIII, p. 415.

Native Son, in Sec. 13, T. 10 N., R. 7 E., in the Liberty mining district, 1 mile northeast of Forks of Salmon in the Klamath Forest Reserve. Owner, M. L. Mills; comprises 20 acres; schist bedrock, coarse gold being found on same; 30 feet of gravel; adjoins Forks of Salmon mine; only short season's run on account of lack of water; some good gravel.

Nordheimer, formerly known as *McNeal,* in Sec. 3, T. 10 N., R. 7 E., 5 miles southwest of Forks of Salmon in Klamath Forest Reserve. Owners, Nordheimer Mining Company; H. B. Morey of Menlo Park, secretary; Ed Kingston, superintendent; comprises 60 acres of patented land on Salmon River; schist bedrock; 15 to 25 feet of gravel; equipment two giants, pipe and dwellings; five men employed at rate of $3 per day; has been a good producer. Idle on account of lack of water.

Bibl.: Report VIII, p. 611.

The Pine Grove, hydraulic mine, in Sec. 10, T. 46 N., R. 9 W., in the Oak Bar mining district; is one of the famous placer properties on the Klamath River. It is 28 miles west of Hornbrook at an elevation of 2600 feet and comprises an old river bar containing 100 acres. The pay gravel is over 1000 feet wide in places, with a depth of 18 feet and a northeast and southwest course, following the south bank of the Klamath River. The bedrock is schist of medium hardness, and coarse gold is found here. It was formerly worked with hydraulic elevators, but at present a drag scraper is used to convey the gravel to the sluice boxes, a 2-reel steam hoist being attached to the scraper. Water for the sluice boxes is pumped from the river. Wood is the fuel used. The owner, H. H. Barton, has bonded this group to W. B. Carlock, of San Francisco; eight men are employed; about 30 acres have been worked

and some of this ground, removed years ago, was very rich. From a pit 100 feet square on bedrock, at a depth of 18 feet, over $6000 was taken out. In one day $300 of bedrock pay was panned out.

Bibl.: Report VIII, p. 592.

Portuguese, in Sec. 4, T. 46 N., R. 12 W., in the Seiad mining district, 12 miles west of Hamburg Bar in the Klamath Forest Reserve. Owner, H. Wood; comprises 140 acres of patented land along the Klamath River; schist bedrock; 20 to 50 feet of gravel, with from 4 to 10 feet of cemented gravel in places, requiring blasting; water is obtained from Portuguese Creek through 1½-mile ditch; equipment consists of three No. 2 giants, dwellings and 2500 feet of pipe; yearly production from $10,000 to $15,000; about 30 acres have been worked to date; bonded to Jerome Mining Company, of San Francisco. Idle on account of lack of water.

Bibl.: Report VIII, p. 595; XII, p. 290; XIII, p. 420.

Quartz Gulch, formerly known as *Wingate Hill,* in Secs. 5 and 6, T. 15 N., R. 7 E., in the Happy Camp mining district, 8 miles southwest of Happy Camp in the Klamath Forest Reserve. Owner, J. H. Wells; comprises 40 acres of patented land; slate bedrock, 10 to 20 feet of gravel. Idle for several years; good producer at one time.

Bibl.: Report VIII, p. 601.

Russian Hill, formerly known as *Russian Dump, Ahlgren* and *Red Hill,* in Secs. 23 and 24, T. 40 N., R. 12 W., in the Liberty mining district, 5 miles west of Sawyer's Bar. Owner, A. Ahlgren; comprises 80 acres on North Fork of Salmon River; slate bedrock; 40 to 80 feet of gravel; water from North Fork of Little Salmon River, through 3-mile ditch; two giants, 2800 feet of pipe and derrick; good producer, having been worked since the eighties; operated during the winter.

Bibl.: Report XII, p. 276; XIII, p. 386.

Rycroft, in Sec. 14, T. 39 N., R. 9 W., in the Callahan mining district, 6½ miles southwest of Callahan in the Klamath Forest Reserve. Owner, S. Rycroft; comprises 60 acres, on Slide Creek; schist bedrock; 20 to 40 feet of gravel; two giants and 1000 feet of pipe; considerable gold extracted in past years. Idle. Do only assessment work.

Bibl.: Report XIII, p. 423.

Sauer Kraut, in Sec. 34, T. 11 N., R. 7 E., in the Liberty mining district, 9 miles southwest of Forks of Salmon in Klamath Forest Reserve. Owners, Chinese Company; comprises 40 acres of patented land; slate bedrock, 15 feet of gravel; produces about $2000 per year;

rich gravel in the early days. Idle on account of lack of water; use two No. 2 giants.

Bibl.: Report XII, p. 291; XIII, p. 424.

Seiad, in Sec. 11, T. 46 N., R. 12 W., in the Seiad mining district, 9½ miles west of Hamburg Bar in Klamath Forest Reserve. Owner, T. K. Towne; comprises 60 acres along the Klamath River; schist bedrock; 5 to 20 feet of gravel; water from Seiad Creek through 2-mile ditch; giant and pipe; do only assessment work.

Siskiyou Klondike, in Secs. 15 and 16, in the Oak Bar mining district, 24 miles west of Hornbrook in Klamath Forest Reserve. Owner, H. H. Barton; comprises 40 acres; bedrock schist; 10 feet of gravel; 2-mile ditch from McKinney Creek; located in 1865; some production. Idle.

Siskiyou Mines Company, in Secs. 2, 1, 6, 7, 5, 12 and 18, T. 16 and 17 N., R. 7 and 8 E., in the Happy Camp mining district, in town of Happy Camp, is the largest hydraulic mine in this section. It is owned by the Siskiyou Mines Company, of New York City; Dr. Harbeck, president; C. A. Gardiner, secretary, and W. A. Maguire, superintendent. These holdings, comprising 1500 acres, of which 640 are patented, follow the Klamath River and include several famous old placer claims which were rich and which were only superficially worked by the early miners. The general course of the channel is northwest and southeast; bedrock is schist; gravel from 10 to 60 feet deep, consisting of bars and benches; water is obtained from Thompson Creek, through 3 miles of ditch and 10 miles of flume; equipment consists of five giants, several thousand feet of pipe and dwellings; ten men employed at present; operating expenses are heavy during the season.

Siskiyou River Bend, formerly known as the *Lou Daggett,* and containing 20 acres, has been worked for many years and considerable gold extracted. It is in Sec. 9, T. 46 N., R. 9 W., 30 miles west of Hornbrook, in the Oak Bar mining district, at an elevation of 2700 feet. The bedrock is schist; gravel from 20 to 50 feet deep with 10 feet of pay. The present owner, A. C. Aiken, of San Francisco, has spent considerable time and money experimenting on methods of working the ground; during the last season's run of three months $15,000 was produced. Evans hydraulic elevator is used, water being obtained from Buckhorn Creek through a ditch 9 miles in length.

Slumway, in Sec. 3, T. 10 N., R. 7 E., in the Liberty mining district, 4½ miles northwest of Forks of Salmon in Klamath Forest Reserve. Owner, Bennett Company; comprises 40 acres of patented ground; schist bedrock; 30 feet of gravel; water from Slumway Creek, through 3-mile ditch. Idle since 1910.

Squaw Gulch, also known as *French John,* in Sec. 1, T. 40 N., R. 9 W., in the Callahan mining district; 4 miles northwest of Callahan, in the Klamath Reserve. Owner, D. L. Jones; comprises 60 acres; schist bedrock; 30 feet of gravel; two giants and 800 feet of pipe; water from Sugar Creek through a ditch 9 miles long, carrying 800 inches; worked only in winter; small producer; worked years ago as a drift mine and some rich gravel removed.

Sturn, formerly known as the *Colby,* in Sec. 2, T. 16 N., R. 7 E., in the Happy Camp mining district, 1 mile north of Happy Camp in the Klamath Forest Reserve. Owner, G. H. Compton; comprises 200 acres of patented land, on old river channel; schist bedrock; equipment consists of small reservoir to collect surface waters, 2 miles of ditch, one giant, and 1000 feet of pipe; production $2000 per season of three months; lack of water limits mining operations; good ground.

Ten Eyck, in Sec. 28, T. 12 N., R. 6 E., in the Liberty mining district, 3 miles northwest of Somes Bar. Owner, W. Lord; comprises 80 acres, slate bedrock; coarse gold found in bedrock crevices; two giants; good producer for a number of years; yearly production said to exceed $20,000; fifteen men employed during season; four men working at present; water from Ten Eyck Creek.

Bibl.: Report VIII, p. 605; XIII, p. 430.

Thomain, in Sec. 5, T. 39 N., R. 11 W., in the Liberty mining district, 4 miles southeast of Sawyer's Bar in the Klamath Forest Reserve. Owners, F. and C. F. Thomain; comprises 20 acres, on Eddy's Gulch; slate bedrock; 10 to 30 feet of gravel; water from Eddy's Gulch through 1 mile of flume; one giant and 800 feet of pipe; operated only during the winter; small producer.

Two and a Half, formerly known as the *Walker,* in Sec. 20, T. 40 N., R. 7 W., in the Callahan mining district, 6 miles east of Callahan, in the Klamath Reserve. Owner, W. Walker; comprises 40 acres, on Grouse Creek; bedrock is schist; 10 to 20 feet of gravel; water from Grouse Creek through a ditch 2½ miles long carrying 600 inches; two giants and 600 feet of pipe. Idle at present; said to have produced $200,000.

Willard, in Sec. 30, T. 46 N., R. 11 W., in the Hamburg Bar mining district, ¾ mile south of Hamburg Bar in the Klamath Reserve. Owners, Willard & Hickman; comprises 20 acres along the Klamath River; schist bedrock; 30 to 50 feet of gravel; water obtained from Max Creek through 1-mile ditch; one giant and 500 feet of pipe. Only worked in a small way.

Bibl.: Report XII, p. 294; XIII, p. 432.

Wm. Burns, in Sec. 33, T. 39 N., R. 11 W., in the Liberty mining district, 2 miles southeast of Sawyer's Bar in the Klamath Reserve. Owner, J. R. Peterson; comprises 20 acres, patented; slate bedrock; 10 to 30 feet of gravel; one giant, 500 feet of pipe and a derrick. Worked during the winter season; small producer.

Windeler, in Sec. 20, T. 40 N., R. 11 W., in the Liberty mining district, 1 mile north of Sawyer's Bar in the Klamath Reserve. Owner, J. C. Windeler; comprises 20 acres on Jackass Gulch; slate bedrock; 30 feet of gravel; one giant and 500 feet of pipe; some coarse gold found on bedrock. Little work during the winter; small producer.

Wood & Fehely, in Sec. 4, T. 46 N., R. 12 W., in the Seiad mining district, 11 miles west of Hamburg Bar in the Klamath Reserve. Owners, Wood & Fehely; comprises 60 acres, patented, on the Klamath River; slate bedrock, best values being found in the soft bedrock; 10 to 30 feet of gravel; water from Thompson Creek through a ditch 1½ miles long; three giants and 1800 feet of pipe; employ four men during the season. Idle in 1912; good ground; has been a steady producer.

Bibl.: Report XIII, p. 432.

Wright & Fletcher, in Secs. 7 and 8, T. 43 N., R. 9 W., in the Oro Fino mining district, 4 miles northeast of Greenview. Owners, Wright Brothers; comprises 80 acres; bedrock is quartz-porphyry; 20 to 60 feet of gravel; water from Kidder Creek through two ditches, one 9 miles long, also furnishes power for the Johnson mill, and the other, 4½ miles in length, for the hydraulic operations; two giants and 2100 feet of pipe; best ground has been worked and yielded a good production; property only worked on a small scale. Idle on account of lack of water.

Bibl.: Report VIII, p. 609; XII, p. 294; XIII, p. 433.

GOLD MINES—GROUND SLUICING.

The extraction of gold from placer deposits by means of ground sluicing is pursued to a limited extent in the Hawkinsville, Oak Bar, Greenhorn, and Liberty mining districts.

Anderson, in Sec. 33, T. 39 N., R. 11 W., in the Liberty mining district, 1¾ miles southeast of Sawyer's Bar in the Klamath Forest Reserve. Owners, Peterson Brothers; comprises 20 acres on Eddy's Gulch; slate bedrock; 20 to 30 feet of gravel; water from continuation of Burns' flume, 1 mile in length; adjoins Burns' placer; worked on a limited scale during the winter; small producer.

Bibl.: Report VIII, p. 617.

Baines, in Sec. 13, T. 39 N., R. 12 W., in the Liberty mining district, 10 miles southwest of Sawyer's Bar in the Klamath Forest Reserve. Owner, G. A. Baines; comprises 20 acres on Bear Creek; slate bedrock;

10 to 20 feet of gravel; water from Bear Creek through ½ mile of flume; worked during the winter on a limited scale; small producer.

Beaver Creek, in Secs. 30 and 31, T. 47 N., R. 7 W., in the Virginia Dale mining district, 2 miles northwest of Gottville on Beaver Creek in Klamath Reserve. Owner, J. E. Jones; comprises 160 acres, patented; slate bedrock; 5 feet of gravel. Idle for several years.

Beaver Creek, in Sec. 6, T. 46 N., R. 8 W., in the Oak Bar mining district; 28 miles west of Hornbrook. Owners, Paines & Barton; 104 acres patented; 15 feet of gravel; schist bedrock. Idle.

Big Slide, in Sec. 19, T. 46 N., R. 8 W., in the Oak Bar mining district, 28 miles west of Hornbrook in the Klamath Forest Reserve. Owner, E. F. Rider; comprises 20 acres of land; schist bedrock; 10 feet of gravel. Idle.

Brazil, in Sec. 11, T. 45 N., R. 7 W., in the Hawkinsville mining district, 3 miles west of Yreka. Owner, A. Brazil; in Klamath Forest Reserve; 80 acres, located in 1856; water from Greenhorn ditch; 10 feet of gravel; slate bedrock; small output.

Bibl.: Report VIII, p. 612; XIII, p. 391.

Buckeye Bar, formerly known as *Jackson,* in Sec. 9, T. 46 N., R. 9 W., in Oak Bar mining district, 26 miles west of Hornbrook. Owners, Jackson Brothers; in Klamath Reserve; bedrock is schist; gravel is 10 feet deep. Idle on account of lack of water; 2 miles of ditch from McKinney Creek; contains 60 acres.

Bibl.: Report VIII, p. 592; XII, p. 279; XIII, p. 391.

Canal Gulch, in Sec. 4, T. 45 N., R. 7 W., in Hawkinsville mining district, 3 miles north of Yreka. Owner, W. Koester; in Klamath Forest Reserve; 20 acres, located in 1876; worked in spring; only little water; 10 feet of gravel; slate bedrock.

Enterprise, in Sec. 16, T. 46 N., R. 9 W., in Oak Bar mining district, 24 miles west of Hornbrook. Owner, R. J. Fenile; in Klamath Forest Reserve; 40 acres of ground; schist bedrock; 10 feet of gravel. Idle.

Indian Bar, in Sec. 30, T. 11 N., R. 7 E., 6 miles northeast of Forks of Salmon in Klamath Forest Reserve. Owners, Ayles & Dunn; comprises 40 acres; schist bedrock; 15 feet of gravel. Idle; only do assessment work.

Bibl.: Report XII, p. 277; XIII, p. 407.

John Miller, in Sec. 3, T. 45 N., R. 7 W., in Hawkinsville mining district, 4 miles north of Yreka. Owner, J. A. Tiexeria; in Klamath Forest Reserve; 40 acres patented; 10 feet of gravel; slate bedrock. Idle for several years.

Bibl.: Report XIII, p. 409.

McKinney Creek, in Sec. 9, T. 46 N., R. 9 W., in Oak Bar Mining district, 26 miles west of Hornbrook. Owners, S. H. and S. R. Crary; in Klamath Forest Reserve; contains 40 acres; schist bedrock; 12 feet of gravel; water from McKinney Creek through a ditch 2½ miles long.

O'Donnell, in Secs. 3, 4 and 10, T. 45 N., R. 7 W., in Hawkinsville mining district, 3 miles north of Yreka. Owner, Mrs. O'Donnell; in Klamath Forest Reserve; 45 acres patented; worked since 1856; slate bedrock; 10 to 20 feet of gravel; small production.

Bibl.: Report XIII, p. 418.

Paine, in Sec. 21, T. 46 N., R. 9 W., 28½ miles west of Hornbrook in the Oak Bar mining district in the Klamath Forest Reserve. Owner, A. A. Paine; schist bedrock; 8 feet of gravel; comprises 20 acres. Idle.

Santana Brothers, in Sec. 11, T. 45 N., R. 7 W., in Hawkinsville mining district, 2½ miles north of Yreka. Owners, Santana Brothers, formerly known as Joe Lemois; 60 acres located in 1856; 7 feet of gravel; slate bedrock; small production. Idle until spring.

Bibl.: Report XIII, p. 424.

Simas & Rose, in Sec. 25, T. 45 N., R. 8 W., in Greenhorn mining district, 4½ miles west of Yreka. Owners, Simas & Rose; in Klamath Forest Reserve; 160 acres patented; located in 1870; 8 feet of gravel; slate bedrock; 2 miles of ditch; season from February to June. Idle.

Sylvester Ramus, in Sec. 11, T. 45 N., R. 7 W., in Hawkinsville mining district, 2½ miles north of Yreka. Owner, S. Ramus; in Klamath Forest Reserve; 87 acres; water from lower Greenhorn ditch, 6 miles long; 5 feet of gravel; slate bedrock. Idle; worked each spring; small output.

Sulphur Springs, in Sec. 18, T. 47 N., R. 7 W., in the Virginia Bar mining district, 7 miles north of Gottville, on Empire Creek in Klamath Forest Reserve. Owner, E. Campbell; comprises 20 acres; schist bedrock; 3 to 5 feet of gravel; only small production in 1912.

Tom Rogers, in Sec. 11, T. 45 N., R. 7 W., in Hawkinsville mining district, 2 miles north of Yreka. Owner, Phillips Brothers; in Klamath Forest Reserve; 113 acres, patented; discovered in 1860; water from Greenhorn Creek; short season. Idle since May; 5 to 10 feet of gravel; slate bedrock.

Bibl.: Report XIII, p. 430.

GOLD MINES—DRIFT.

Allgood & Castell, in Sec. 12, T. 11 N., R. 7 E., in the Liberty mining district, 3 miles southeast of Somes Bar. Owners, Allgood & Castell; comprises 40 acres; slate bedrock; 30 feet of gravel. Idle; some rich gravel worked at one time.

Ascondry, in Sec. 10, T. 46 N., R. 9 W., in Oak Bar mining district, 27 miles west of Hornbrook. Owner, W. Quingley; contains 100 acres; 50-foot shaft; schist bedrock; 8 feet of gravel. Idle.

California Bar, in Sec. 18, T. 46 N., R. 6 W., in the Cottonwood mining district, 9 miles southwest of Hornbrook in Klamath Forest Reserve. Owners, Vene Gold Bar Mining Company; comprises 20 acres on old river bar; bedrock is slate; old shafts caved. Idle at present; water from Klamath River through a ditch 1½ miles long; some good ground.

Bibl.: Report XIII, p. 391.

Consolidated Sciwash, in Sec. 6, T. 44 N., R. 8 W., in the Deadwood mining district, 6 miles north of Fort Jones. Owner, H. Madison; comprises 90 acres, patented, on McAdams Creek; quartz-porphyry bedrock; 30 feet of gravel; 450-foot tunnel, and three 50-foot shafts (all caved); good producer at one time. Idle for a number of years.

Bibl.: Report XIII, p. 395.

Deep Channel, formerly known as *Taylor & Maplesden,* in Sec. 36, T. 46 N., R. 11 W., in the Hamburg Bar mining district, ⅛ mile west of Hamburg Bar in the Klamath Forest Reserve. Owner, Deep Channel Mining Company, of Portland, Oregon; president, J. L. McKittrick; comprises 40 acres on the Klamath River; schist bedrock; gravel is from 20 to 50 feet deep; 100-foot tunnel 5′ x 7′ and 60-foot shaft, 4′ x 6′ (abandoned). Idle during 1913; some good ground and has been a steady producer.

Bibl.: Report XII, p. 293; XIII, p. 429.

Doolittle, in Sec. 5, T. 17 N., R. 8 E., in the Happy Camp mining district, 6 miles northeast of Happy Camp in the Klamath Forest Reserve. Owner, M. Doolittle; comprises 40 acres of patented land along the Klamath River; schist bedrock; 30 feet of gravel; 120-foot tunnel, 5′ x 7′. Idle; producer at one time.

Bibl.: Report XIII, p. 404.

Elk Creek, in Sec. 15, T. 16 N., R. 7 E., in the Happy Camp mining district, 1 mile southwest of Happy Camp in the Klamath Reserve. Owners, Chinese Company; comprises 60 acres along the Klamath River; schist bedrock; 10 to 40 feet of gravel; 220-foot tunnel, 5′ x 7′; paid well at one time. Idle at present.

Bibl.: Report XII, p. 281; XIII, p. 398.

Empire Bar, in Sec. 2, T. 46 N., R. 7 W., in the Virginia Dale mining district, in town of Gottville, in the Klamath Reserve. Owners, an incorporated company; comprises 20 acres, patented; slate bedrock;

5 to 8 feet of gravel; old shafts; small steam hoist; worked by leasers at times, but idle at present; has been a good producer.

Bibl.: Report VIII, p. 589.

Evans, formerly known as the *Berry*, in Sec. 17, T. 8 N., R. 7 E., in the Happy Camp mining district, 5½ miles northeast of Happy Camp in the Klamath Reserve. Owner, C. A. Evans; comprises 20 acres; bedrock is schist, with quartz stringers running through it; depth of gravel is 40 feet; 60 feet tunnel, 5′ x 7′ feet; only do assessment work; small producer at one time.

Everill, in Sec. 26, T. 46 N., R. 11 W., in Hamburg Bar mining district, 4 miles southwest of Hamburg Bar. Owner, J. H. Everill; comprises 40 acres on the Klamath River; bedrock is slate; 120-foot tunnel on bedrock; old 60-foot shaft; equipment: dwelling, derrick, pipe, sluice boxes; good ground; leased to an incorporated company; T. C. Williams, superintendent; three men employed.

Bibl.: Report XII, p. 281; XIII, p. 400.

French Bar Placer, in Sec. 17, T. 46 N., R. 10 W., in the Scott River mining district, ½ mile northwest of Scott Bar, in the Klamath Forest Reserve. Owner, Z. E. Russell; comprises 20 acres, on Scott River; slate bedrock; 20 feet of gravel; 40-foot tunnel, 5′ x 7′; only do assessment work.

Gold Lead, in Sec. 8, T. 45 N., R. 10 W., in the Scott River mining district, 1¼ miles north of Scott Bar in the Klamath Reserve. Owner, M. Andrews; comprises 20 acres on the Scott River; slate bedrock; 10 to 20 feet of gravel; water from Tom Creek through 1 mile of ditch; 90 feet tunnel (5′ x 7′), on bedrock; equipment: car, blacksmith shop, mining tools; one man employed at $3 per day; production generally about $4000 (five months run); some coarse gold found on the bedrock; easy ground to work.

Klamath River Gold Mining Company, in Sec. 15, T. 46 N., R. 7 W., in the Cottonwood mining district, 12 miles southwest of Hornbrook in Klamath Forest Reserve. Owners, Klamath River Gold Mining Company; comprises 20 acres on old bar of Klamath River; bedrock is slate; gravel 5 to 20 feet deep; old shafts to bedrock; company spent considerable money without any return. Idle.

Lucky Bob, in Sec. 2, T. 46 N., R. 7 W., in the Virginia Dale mining district, in town of Gottville. Owners, Freshour Brothers; comprises 40 acres, being a bench and bar along the Klamath River; slate bedrock; 7 feet of gravel; old shafts from 30 to 50 feet deep; good producer years ago; worked by leasers at times, but idle at present.

Bibl.: Report XII, p. 287; XIII, p. 413.

McMahon, in Sec. 25, T. 40 N., R. 9 W., in the Callahan mining district, 3 miles southeast of Callahan in the Klamath Reserve. Owner, C. A. Crowley; comprises 40 acres, on the Scott River; schist bedrock; good pay in the soft spots; 150-foot tunnel; old 40-foot shaft (caved); worked a little during the winter; small producer.

Bibl.: Report XII, p. 287; XIII, p. 415.

Miller, in Sec. 34, T. 44 N., R. 9 W., in the Callahan mining district, 5 miles southeast of Callahan in the Klamath Reserve. Owners, Jackson & Biedenbeck; comprises 20 acres; schist bedrock; 40 feet of gravel; 2 tunnels 100 and 60 feet in length on the bedrock; water from Jackson Creek through ½ mile of flume; no production since 1911; some good ground.

Bibl. Report XIII, p. 415.

Montezuma, in Sec. 20, T. 40 N., R. 8 W., in the Callahan mining district, in town of Callahan in the Klamath Reserve. Owner, Hopyick; comprises 20 acres on the Scott River; schist bedrock; 20 to 50 feet of gravel; Chinese working over an old dump; noted producer years ago; best ground worked out.

Bibl.: Report VIII, p. 612; XII, p. 288; XIII, p. 416.

Paradise Flat, in Sec. 29, T. 40 N., R. 11 W., in the Liberty mining district, ⅛ mile west of Sawyer's Bar in the Klamath Reserve. Owner, A. Meyers; comprises 40 acres, patented, along the North Fork of the Salmon River; slate bedrock; 10 to 50 feet of gravel; old bench; 1000-foot tunnel; only worked on a small scale; said to have produced $140,000; seems to be a second bench, carrying good pay.

Poverty Point, in Sec. 18, T. 46 N., R. 9 W., in the Oak Bar mining district, 32 miles west of Hornbrook on Klamath River. Owner, H. H. Barton; 200 acres (40 acres patented); located in 1876; in Klamath Reserve; country rock, schist and diorite; 20 feet of gravel; 2400-foot tunnel (caved); produced $23,000. Idle for ten years.

Bibl.: Report VIII, p. 592; XIII, p. 420.

Schuler, in Sec. 16, T. 45 N., R. 10 W., in the Scott River mining district in the town of Scott Bar in the Klamath Reserve. Owner, M. Schuler; comprises 20 acres on Scott River; slate bedrock; 20 to 30 feet of gravel; 60 feet tunnel in river bank; only do assessment work; some rich ground worked at one time.

Bibl.: Report XIII, p. 425.

Sugar Hill, in Sec. 20, T. 40 N., R. 8 W., in the Callahan mining district, 5 miles southwest of Callahan in the Klamath Reserve. Owner, G. W. Smith; comprises 40 acres on Fox Creek; schist bedrock,

coarse gold being found in crevices in this bedrock; 320-foot tunnel, 40-foot shaft (caved); 20 to 40 feet of gravel, loose. Idle; only do assessment work; some good pay extracted years ago.

Bibl.: Report VIII, p. 611.

Whistle Bar, formerly known as the *Blake,* in Sec. 29, T. 40 N., R. 11 W., in the Liberty mining district, at Sawyer's Bar in the Klamath Forest Reserve. Owner, E. Curran; comprises 20 acres on the North Fork of the Salmon River; slate bedrock; 30 to 100 feet of gravel, loose; 400-foot tunnel, 3′ x 7′; good producer at one time. Idle at present; only do assessment work; about one half of the gravel has been worked.

Bibl.: Report VIII, p. 616.

Wilson, in Sec. 29, T. 44 N., R. 8 W., in the Deadwood mining district, 8½ miles north of Fort Jones. Owner, F. L. Wilson; comprises 40 acres on Deadwood Creek; quartz-porphyry bedrock; 30 feet of gravel; water from Deadwood Creek through ½-mile of ditch; 320 feet bedrock tunnel and 50-foot shaft (caved); best ground has been worked; only do assessment work.

Bibl.: Report XIII, p. 432.

GOLD DREDGING.

Only one dredge in operation in Siskiyou County during the year 1913. This boat, owned by the Siskiyou Dredging Company, is working on McAdams Creek, some 5 miles north of the town of Fort Jones.

The Scott River Dredging Company operated a dredge on the Scott River near Callahan during 1908 and 1909. The project was finally abandoned and the machinery sold to the Trinity Dredging Company, and hauled to Trinity Center, Trinity County, where it was installed.

Bibl.: Bull. No. 57, p. 221.

The Northern California Dredge Company, owning several acres of land along the Klamath River in Sec. 36, T. 46 N., R. 11 W., M. D. M., about ½ mile west of Hamburg Bar, endeavored to work their land by means of a suction dredge, which proved a failure. The dredge has been idle since 1911.

Siskiyou Dredging Company, in Secs. 14, 6 and 35, T. 44 and 43 N., R. 8 and 9 W., in the Deadwood mining district, 5 miles north of Fort Jones, is the only dredge in operation in Siskiyou County. It is owned by the Siskiyou Dredging Company; G. J. Carr, president; J. C. Osgood, secretary; J. W. Boles, superintendent; home office is in San Francisco; comprises an area of 165.5 acres on McAdams Creek, 120 of which are patented, and includes the old Oak Grove, Diggles, Mathewson and

Shaw drift claims; course of the channel is north and south; quartz-porphyry bedrock; 30 to 60 feet of gravel, loose and easily removed; 2 miles of flume from McAdams Creek for water for floating dredge during the summer season; 5½ cu. ft. Bucyrus type dredge with 98-foot digging ladder, and will handle gravel to a depth of 50 feet below the water level, and has a capacity of 2000 cubic yards per day or 154 yards per hour; 10 miles of power line; electricity from California-Oregon Power Company, costing $1\frac{1}{10}$ cents per cubic yard; ten men are employed; total operating cost per cubic yard is 6 cents; property acquired in 1909, and dredge has been operating since 1910; good dividends declared; about 20 acres have been worked.

Bibl.: Bull. No. 57, p. 223.

GRANITE.

The greater portion of the granite in Siskiyou County is too much shattered to be used for monument or building purposes. There is a large body of granite, however, on Craggy Mountain, T. 41 N., R. 8 W., from which some good building blocks have been obtained. Another deposit, southeast of Etna on Mill Creek in Sec. 1, T. 41 N., R. 9 W., contains some fine-grained stone that has been used for monument work. A similar grade of granite is found in the southwest and southeast corners of T. 40 N., R. 8 and 9 W.

Bibl.: Bull. No. 38, p. 54.

IRON.

Iron float is found in Sec. 10, T. 46 N., R. 10 W., on the north side of the divide between Buckhorn Creek and the Klamath River.

Bibl.: Bull. No. 38, p. 304.

LIMESTONE.

Two limestone deposits, one northeast of Greenview and the other southwest of Callahan, have been worked and the material has been converted into lime.

Bibl.: Bull. No. 38, pp. 92–93.

Burton, in Sec. 17, T. 43 N., R. 9 W., in the Oro Fino mining district, 4 miles northeast of Greenview. Owned by T. Martin; comprises 40 acres, discovered in 1889; large limestone deposit having a width of 1000 feet, but only 15 feet thick; limestone burned in kiln made of rocks, having the arch-shape form; capacity of kiln, 6 tons in five days; good grade of limestone; product produced upon demand.

Farrington, in Sec. 24, T. 40 N., R. 9 W., in the Callahan mining district, 2½ miles southwest of Callahan. Owned by S. Farrington; comprises 20 acres, located in 1873; massive deposit of limestone; the

Photo No. 5. Marble Mountain, Siskiyou County.

extent not determined; surface stripped and limestone extracted from open cuts and burned in a small kiln of a capacity of 10 tons in four days; product is of splendid quality and was used in the hotel at Callahan; very little demand for the product. Idle.

Bibl.: Bull. No. 38, pp. 92–93.

MACADAM.

Steele Quarry, in Sec. 27, T. 45 N., R. 7 W., ¾ mile southeast of Yreka. Owned by J. M. Steele; comprises 100 acres, located in 1896; deposit just being opened up and its extent not determined as yet; plant consists of a crusher, operated by gasoline, cars, and mining tools; five men are employed; rock used on streets in Yreka.

MARBLE.

A belt of marble runs from a short distance west of Etna Mills, in a northwest direction along the eastern slope of the Salmon Mountains, forming, farther north, part of the Marble Mountains, and in the Grider Mountains showing north of the Klamath River on Thompson Creek, and running farther north into Oregon.

Bibl.: Report XIII, p. 632; Bull. No. 38, pp. 107-108.

Marble Mountain, a very large belt in Secs. 16, 19, 20 and 21, T. 43 N., R. 10 W., M. D. M., is a noted landmark; the limestone is metamorphosed, producing all varieties and colors of marble, but principally pure white. (See photo No. 5.)

Bibl.: Bull. No. 38, p. 107.

Barton & Barham, in Sec. 18, T. 46 N., R. 9 W., in the Oak Bar mining district; owned by Barton et al.; comprises 160 acres, located in 1913; massive deposit in schist; no work done on claims; marble is of the clouded variety, showing black streaks and probably of no commercial value.

Bibl.: Report XIII, p. 632.

Luce, in Sec. 41, T. 41 N., R. 8 W., in the Deadwood mining district, 3 miles north of Fort Jones. Owner, A. H. Luce; comprises 160 acres, patented, located in 1907; dike in schist, 300 feet wide and can be traced for 1500 feet, and is of good quality, taking a fine polish and easily worked; only small amount extracted from shallow cuts. Idle at present.

McDaniels, in Sec. 6, T. 41 N., R. 9 W., M. D. M., on road from Etna to Sawyer's Bar. Owned by R. McDaniels of Etna; seams of diabase through the marble and body of pure white marble much smaller than in the Parker deposit.

Bibl.: Report XIII, p. 632; Bull. No. 38, p. 107.

Parker, in Sec. 32, T. 42 N., R. 9 W., near Etna. Owned by A. Parker, Jr.; belt from 100 to 200 feet wide at elevation of 4000 feet; marble heavily bedded, in places being perfectly white and fine-grained, while in other places it is pink-colored and very coarsely crystalline; worked to a limited extent.

Bibl.: Bull. No. 38, p. 107.

Thompson Creek, in Sec. 8, T. 17 N., R. 8 E., H. M., in the Happy Camp mining district, 8½ miles northeast of Happy Camp on Thompson Creek. Owner, J. C. Wood; comprises 40 acres, located in 1890; large massive beds in schist and serpentine, few open cuts, so that extent of marble deposit not determined; it is hard and takes a good polish; the crystals are large, white and translucent. Idle.

Bibl.: Report XIII, p. 632.

MINERAL WATER.

Shasta Springs, on the Oregon branch of the Southern Pacific Railroad in Sec. 12, T. 39 N., R. 3 W., are owned by the Shasta Springs Mineral Water Company, and the only water from Siskiyou County on the market. These springs were first brought to notice during the construction of the railroad in 1887.

The three springs—Shasta, Glacier and Keystone—are all about 300 feet apart. The water has a temperature of 51° F., and contains considerable carbonic acid gas, magnesium, potassium, iron, and a little manganese, lithium and arsenate. The bedrock is tufa, overlaid with doleritic lava. The equipment consists of bottling works and dwellings.

Bibl.: Report XI, pp. 449–451; Mineral Springs of California, Anderson, p. 244.

Upper Soda Springs, in Sec. 24, T. 39 N., R. 4 W., 2 miles north of Dunsmuir. Owned by George McCloud; water is heavily charged with carbonic acid gas; formation is similar to the Shasta Springs section; water not on the market.

Bibl.: Report XI, p. 452; Mineral Springs of California, Anderson, p. 260.

Scott Springs, in Sec. 7, T. 39 N., R. 3 W., 3 miles north of Dunsmuir; water and formation similar to Shasta Springs. Owned by J. J. Scott & Company.

Bibl.: Report XI, p. 452.

Castle Crag Soda Springs, at Castle Crag. Owned by Pacific Improvement Company; water has a temperature of 53° F., and contains sodium, potassium, magnesium, calcium, with a trace of iron, silicia, alumina, manganese, barium, lithium, borates, ammonium carbonate; it is a well known summer resort.

Klamath Hot Springs, in Sec. 27, T. 48 N., R. 3 W., at Klamath Springs. Owned by Edson Estate; claimed good for rheumatism and blood diseases; several dwellings on the property.

Bibl.: Mineral Springs of California, Anderson, p. 183.

Siskiyou Mineral, in Secs. 33 and 34, T. 48 N., R. 9 W., 14 miles northwest of Walker. Owned by J. Garreston; water contains considerable iron and magnesia, and said to be good for blood diseases; conducted as a summer resort; several dwellings on the property.

Bibl.: Report XIII, p. 521.

Warmcastle Soda Springs, in Sec. 13, T. 39 N., R. 3 W., 1 mile south of Nabar. Owned by Estate of Judge Warmcastle; elevation is 3000 feet; water contains considerable soda.

ORNAMENTAL STONES.

Vesuvianite is found on the South Fork of Indian Creek, 12 miles north of Happy Camp, on land owned by Dr. A. E. Heighway; discovered in 1901; outcrops for 300 feet along the hillside, above the creek, and large masses have fallen into the bed of the creek below. It is a hard and handsome stone, olive to green in color, and takes a fine polish. The associated rock is serpentine; the rich translucent green color, fine-grained sub-splintery fracture and brilliant luster, when polished, strongly suggest jade, and many have called it by that name; deposit has not been worked. This variety of vesuvianite is also known as *californite.* F. H. Dakin of San Francisco also has claims covering portions of the deposit.

Bibl.: Bull. No. 37, pp. 93–94; Bull. No. 67, pp. 125–126.

Brusse, in Sec. 34, T. 17 N., R. 7 E., in the Happy Camp mining district, 3 miles north of Happy Camp on Indian Creek. Owned by F. A. Brusse; discovered in 1899; not in place, but pieces of float weighing several pounds found along the creek; associated with serpentine; resembles the Heighway mineral.

Griffin Onyx Quarries are situated 6 miles south of Berryvale. Specimens in the State Mining Bureau are 7355 and 8969.

Bibl.: Bull. 37, p. 112.

PLATINUM.

Small amounts of platinum are obtained with the gold in some of the placer mines of Siskiyou County, particularly on the streams traversing serpentine areas.

QUICKSILVER.

A cinnabar deposit in the northern part of the county on the headwaters of the West Fork of Beaver Creek above Oak Bar has been worked to some extent by the Siskiyou Quicksilver Mining Company. There is another small deposit on Horse Creek, which has not developed at all.

The holdings of the *Siskiyou Quicksilver Mining Company,* of San Francisco, comprise several acres on the headwaters of the West Fork of Beaver Creek, some 15 miles west of Cole's Station. The development consists of several hundred feet of tunnelling and drifts. The reduction plant consists of a 10-ton furnace. Idle for some time; had a small production.

Bibl.: Report XII, p. 370; XIII, p. 602; Bull. 27, p. 196.

Barton & Lange, in Sec. 22, T. 46 N., R. 9 W., in the Klamath Reserve, 4 miles west of Oak Bar in the Oak Bar mining district. Owners, Barton & Lange; comprises 60 acres of patented land, located in 1890; massive dike with no definite strike or dip; the country rock (schist and diorite), impregnated with cinnabar; deposit 160 feet wide and can be traced 2000 feet; short tunnel and open cuts comprise the workings; a few pounds (selected) of the semi-transparent crystals of cinnabar sold to Chinese for $4 per pound, to be used in paints and for medicinal purposes. Idle several years.

Bibl.: Report XIII, p. 602. Bull. No. 27, p. 196.

SANDSTONE.

A very extensive bed of sandstone runs along the east side of the Kildal Hills, Black Mountain Range, and Cottonwood Mountains, into Oregon; also found east of Yreka in two large exposures. It forms the rim of the Shasta Valley, having a northeast direction in Sec. 13, T. 45 N., R. 7 W., and also crops out a few miles south of Ager on the Herr ranch, where coal is found. Same belt exposed in the vicinity of Hornbrook in the ridges surrounding the valleys of the Klamath River and the lower part of Cottonwood Creek. A belt of fine-grained sandstone about ¼ mile in width west of Hornbrook along the rim of Cottonwood Creek forms a landmark, as its surface sloping east comprises the bare lower slope of the mountains, its gray color being distinguishable from a long distance; it is very fine grained, compact and hard, consisting of small granules of quartz, intermixed with some small ones of hornblende.

Bibl.: Bull. 38, pp. 139–140.

Antone, formerly known as the Weeks Quarry, in Sec. 2, T. 45 N., R. 7 W., 2 miles northeast of Yreka. Owned by Mrs. C. Antone; com-

prises 160 acres, patented, at an elevation of 2700 feet; occurs in stratified layers from 6 inches to 8 feet thick, and these sheets are pried from the deposit by hand; very little blasting needed; equipment at quarry consists of derrick of 2400 pounds capacity and mining tools; three men employed; stone of good quality, and has been used since 1860; new high school and other buildings in Yreka constructed with this stone; also used for tombstones; leased to J. P. Russell.

Fioch Bros. Quarry, in Sec. 13, T. 45 N., R. 7 W., near Yreka; considerable stone removed; face of the quarry shows massive sandstone, nearly horizontal, dipping slightly east; upper bed is 10 feet thick, coarse grained; of a very uniform texture, and tawny in color.

Bibl.: Bull. No. 38, p. 140.

Southern Pacific Railroad Company owns several quarries in Sec. 29, T. 47 N., R. 6 W., near Hornbrook; stone breaks in large blocks, some weighing 4 to 5 tons; quarries worked by plug and feather method; sandstone used in construction of Jones & Horn buildings in Hornbrook, built in 1888 and shows no signs of weathering.

Bibl.: Bull. No. 38, p. 140.

SOAPSTONE.

Talc is a hydrous silicate of magnesia ($4\ MgO,\ 5\ SiO_2,\ H_2O$) that occurs in different varieties, of which soapstone is one of the most important.

Soapstone is more compact and harder than talc and is used in the manufacture of many articles, such as bath and laundry tubs, switchboards for electrical plants, sinks, griddles and many other articles.

Talc is used as a powder, or flour talc, and as pieces sawed into various sizes and shapes. The flour talc is used in fireproof paints, electric insulators, boiler and steam pipe coverings, toilet powder, in the manufacture of powder and other articles.

Soapstone is found in several places in Siskiyou County, a large expose being noted in the northeast sections of T. 45 N., R. 11 W., southeast of Hamburg Bar, having a course of N. 50° E. and can be traced toward the ridge west of Scott River and is 50 feet wide; it is of good quality and resists the effect of fire for years in fireplaces; also used in sheets $\frac{1}{2}$ to $\frac{3}{4}$ of an inch thick for stove backs. There is another large belt south of Marble Mountain, in T. 13 N., R. 8 E., H. M., near the head of Wolley Creek.

Bibl.: Bull. No. 38, p. 352.

Talc is found in the Cottonwood Mountains, 30 feet wide, on the top of the divide between Beaver and Bumblebee creeks; it has no grit and the iron content gives it a light ochreous color; located by E. Caldwell

of Hamburg Bar. A small exposure is found near Etna, in Sec. 32, T. 42 N., R. 9 W. Owned by J. Conners; it occurs in a serpentine belt and has no grit.

Bibl.: Bull. No. 38, p. 353.

SISKIYOU COUNTY.

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Mineral Resources West of the Rocky Mountains.

TRINITY COUNTY.

Field Work in October, 1913.

INTRODUCTION.

Trinity County, with an area of 3000 square miles, is bounded on the north by Siskiyou, on the east by Shasta and Tehama, on the south by Mendocino, and on the west by Humboldt County, and is drained by the Trinity, Mad, Eel and Van Dusen rivers.

Trinity is a mountainous county, its eastern third being covered by the Coast Range, or Trinity Mountains, the summit of which divides it from Tehama and Shasta counties. The mountain ranges of Scott and Salmon on the north form the boundary between it and Siskiyou. Bully Choop, Baldy and other peaks in the Trinity and Salmon Mountain ranges reach an altitude of over 6000 feet. The hydrography of this county is very simple, the Trinity River and its confluents draining all parts of it. This river, heading in the Scott Mountain division of the Coast Range, after flowing south for 60 miles, makes a detour to the northwest, which course it holds for another 60 miles, and unites with the Klamath River, in Humboldt County. From the section where Coffee Creek, one of the tributaries, flows into the Trinity, the great banks of auriferous gravel commence, parallel with the present river as far as Swift Creek, in Sec. 9, T. 36 N., R. 7 W. The river formerly flowed west of the town of Trinity Center, at an elevation of several hundred feet above its present channel, thence taking a southwesterly course through the Buckeye Range (T. 34 N., R. 9 W.), on to Weaver Basin.

Through this section, Trinity Center to Weaver Basin, is presented the only evidence of ancient river channels, the ancient river emptying into a great lake at the present Weaver Basin. The material filling this channel is composed of volcanic breccia and rocks of all formations and ages—angular, irregular, rounded and intermingled with conglomerates, clay and sands.

The bed of Weaver Basin is a cement, several hundred feet in thickness below the auriferous gravel, deposited from the ferruginous, siliceous and calcareous matter carried down by the waters, erosions of the various formations along the channel settling in the basin, and there cementing. The absence of coarse material leads to the hypothesis that this cementation took place prior to the filling of the cement channel with auriferous sands and gravel.

Bibl.: Bull. No. 540, pp. 16–18, U. S. G. S.

GEOLOGY.

Scott Mountain, formed of igneous, volcanic rocks, with its showing of basalts, trachyte, and obsidian, overlaps the granite as shown in the Salmon Range to the west, its gray peaks towering above the timber line into the region of perpetual snow. On the east is the Trinity Range of granite, syenites, diabase and porphyries. Farther south on the range are metamorphic gneiss, hornblende and mica schists, then a slate belt, followed by a large belt of serpentine crossing in T. 38 N., R. 5 W.

HISTORY.

The first discovery of mineral in this county is attributed to Major Redding, in 1848, who prospected the Trinity River near Redding Creek (T. 32 N., R. 10 W.), and following his discovery came the prospectors from all sections, working the river bars, the ravines and gulches, extracting the gold from the gravel and sands by the rocker, tom and sluice. The evidence of these early workings can be seen along the course of almost every streamlet, creek, gulch and ravine tributary to the Trinity.

MINING CONDITIONS.

While Trinity County is lacking in railway facilities, the abundance of timber and water overcomes this handicap to a large extent.

Gold mining has been the principal industry for over fifty years, the placers giving Trinity County its wealth, and there are still many hundreds of acres of auriferous gravel awaiting exploration. Dredge mining is being successfully pursued at Trinity Center and Lewiston, and large areas in both these districts have recently been prospected for their dredging possibilities.

The La Grange, the largest active hydraulic mine in the world, is in this county.

Quartz mining is still in its infancy; quartz veins, carrying gold, are being prospected and worked in different sections; others that have been operated for several years have yielded and some are still yielding handsome returns to the owners; Dedrick, and the North and East Forks are the most active quartz districts at the present time, due to the installing of machinery and the development work on the Globe and Craig mines in the former section, and to the number of prospects being opened up in the North and East Fork territory.

The Brown Bear is the best known quartz mine in the county, and at one time was the largest producer.

MINERAL RESOURCES.

Its mineral resources consist of gold, silver, platinum, quicksilver, chromic iron, coal, copper, building stone and asbestos. The government records show a total mineral production of $150,000,000. Mineral production of Trinity County, from 1894 to 1913, inclusive, from records of California State Mining Bureau are as follows:

Substances	1894	1895	1896
Gold	$1,012,665 84	$1,166,745 13	$1,296,330 80
Silver	325 00	1,257 28	
Granite	5,000 00		
Quicksilver		137,410 00	139,085 00
Totals	$1,017,990 84	$1,305,412 41	$1,435,365 80

Substances	1897	1898	1899
Gold	$1,078,372 00	$859,255 00	$590,510 00
Silver	259 00	314 00	1,083 00
Quicksilver	29,330 00	151,200 00	123,624 00
Granite			375 00
Totals	$1,107,961 00	$1,010,769 00	$715,595 00

Substances	1900	1901	1902
Gold	$571,605 00	$684,683 00	$719,992 00
Silver	16,567 00	2,668 00	550 00
Quicksilver	105,982 00	58,668 00	10,251 00
Granite	4,535 00	5,500 00	
Copper		761 00	
Platinum			468 00
Totals	$698,689 00	$752,280 00	$731,261 00

Substances	1903	1904	1905
Gold	$607,728 00	$574,814 00	$690,844 00
Silver	2,085 00	135 00	3,044 00
Quicksilver	11,056 00	3,864 00	13,917 00
Granite	75 00		
Copper			
Platinum	200 00	275 00	
Totals	$621,244 00	$579,088 00	$708,255 00

Substances	1906	1907	1908
Gold	$560,843 00	$535,316 00	$602,944 00
Silver	2,961 00	2,399 00	4,239 00
Quicksilver	6,069 00	3,739 00	3,804 00
Granite			
Copper			
Platinum	180 00		
Totals	$570,013 00	$541,454 00	$611,017 00

Substances	1909	1910	1911
Gold	$520,046 00	$500,851 00	$612,149 00
Silver	2,302 00	1,960 00	6,777 00
Quicksilver	7,915 00	5,622 00	2,024 00
Granite			
Stone industry			
Copper			
Unapportioned, 1900-1909 (inc.)	111,307 00		
Totals	$641,570 00	$508,433 00	$620,950 00

Substances	1912	1913
Gold	$723,503 00	$431,862 00
Quicksilver	7,494 00	161 00
Silver	758 00	2,119 00
Stone industry	2,000 00	1,000 00
Totals	$733,755 00	$435,142 00

ELECTRICAL POWER PLANTS.

Humboldt Gas & Electric Company, with its generating plants about one mile northwest of Junction City, on the Trinity River, serves the territory on its line between this town and Eureka, Humboldt County.

Trinity Gold Mining & Reduction Company has a 700 horsepower plant on Coffee Creek and supplies power to the Alta Bert Dredging Company, and to its own property, the Headlight Mine, near Trinity Center.

Trinity Gold Dredge Company, with a 1500 horsepower plant, on Stewart's Fork, supplies power for operating its dredge at Lewiston.

The Bonanza King, generating plant, on the south fork of the Trinity River, supplies electricity for the mine and for the town of Trinity Center.

ASBESTOS.

Surface exposures of asbestos exist in the vicinity of Trinity Center, Weaverville, and Douglas City, but no work has been done on these deposits to determine their extent or commercial value. It is claimed that a promising deposit was uncovered some twenty-five years ago in

constructing the Blythe ditch, in Sec. 28, T. 38 N., R. 6 W., but this ditch is now filled with débris and practically no indications of asbestos can be found.

Bibl.: Bull. No. 38, pp. 264, 360.

The *Trinity Asbestos Mining Company* is opening up a deposit of asbestos on a group of claims near the southern line of the county, and 25 miles from Castella.

CHROMITE.

Chromite is a black ore with a submetallic luster and in appearance resembles some of the iron ores. It occurs in small octahedral crystals and granular masses in serpentine rock, and consists, when pure, of 68% of chromium oxide and 32% of iron oxide; the commercial ores commonly run about 50% of chromium oxide and are generally sold on a 50% basis. It is a source of the chromium salts of commerce and is also used in the manufacture of chrome steel, in basic bricks, and in copper smelting. The quantity of this ore in California far exceeds the demand, the production value in 1912 being $11,260, from 1270 tons, reported from Shasta, Siskiyou and Fresno counties.

A fair grade of chromite is found in Trinity County on the north fork of the east fork of the Trinity River, in T. 38 N., R. 6 W., M. D. M. Another deposit is said to exist near Hay Fork, upon which some development work has been done.

Bibl.: Bull. No. 38, pp. 272, 363, 375.

COAL.

Hay Fork Valley Coal Field. Coal crops out in the bed of Hay Fork River in two points, one in Sec. 12, T. 31 N., R. 12 W., near the town of Hay Fork, and the other in Sec. 7, T. 31 N., R. 11 W., about two miles east of the town. The upper cropping near the town contains two veins of coal, each two feet thick, greatly weathered on the whole, yet in some places a tough black lignite is observed; dip 24° E. Sandstone forms the roof and footwall; deposit can be easily worked. This vein again outcrops in the hills north of the town.

Hyampom Valley Coal Field extends over a large area, the best indications being observed in Secs. 23, 24 and 25, T. 3 N., R. 6 E., H. M. These croppings, near the mouth of the Hay Fork of the Trinity River, are from 3 to 15 feet thick and dip at low angles eastward. Above the coal lies 8 inches of hard blue shale, 14 inches of sandstone, 22 feet of brown shale, and next gravel and soil to the surface. As no development work has been done, the commercial value of this deposit can not be stated.

Poison Camp Field. The croppings of coal are observed in Secs. 15 and 22, T. 2 S., R. 6 E., H. M. The vein is 3 feet thick and dips 24° E.; coal is very young, true lignite, tough and hard and resembles ebony wood; it has a dull brown-black color when split parallel to the fiber and glistening black when broken across the fiber. The coal is of good quality, as it runs high in carbon and low in ash, but the sand roof is so soft that mining would be difficult, unless it changes to a harder sandstone on driving under the hill. The analysis of this coal by Mathyas is as follows: Ash reddish-white color; no coking qualities; water 10.50; volatile matter 38.65; fixed carbon 24.15; ash 26.70.

Coal also outcrops in Sec. 6, T. 33 N., R. 12 W., near Big Bar; it is 2 feet thick, and similar in color and quality to the Hyampom Valley deposit; no development work performed.

Bibl.: Report X, p. 716; XII, pp. 62–63; XIII, p. 56.

COPPER.

The copper prospects of Trinity County are more widely scattered than those of any other county in northern California. They may be grouped in three belts, all of which are essentially areas of peridotite; New River, South Fork (territory lying to the east of the south fork of Trinity River, between Hyampom Valley and Rattlesnake Creek), and Trinity Center, near Carrville, and along the main branch of the Trinity River. Few of the prospects are of very great magnitude, and most of them are too inaccessible for present economical working. Some of the prospects contain ore of high grade and a few shipments have been made.

The expense of working these prespects is apparent when the ordinary freight rate of $15 per ton, from Weaverville or Trinity Center to Redding is considered, while the added cost from the prospects to these points is often large. In spite, therefore, of the natural advantages of timber and water power, copper mining in Trinity County has not yet progressed very far.

Bibl.: Report X, p. 716; XIII, p. 164; Bull. No. 50, pp. 140–146.

Bear Tooth, in the New River mining district; Quimby post office, eight claims on the east side of New River, at an elevation of 2600 feet in Trinity Reserve. Owners, Bear Tooth Mining Company, F. P. Burris, president; four parallel veins, from 1 to 4 feet wide; footwall in gabbro; hanging-wall is serpentine; 3 tunnels, upper 110 feet long, middle 300 feet, lower 125 feet in length; lower 400 feet below upper, has a length of 120 feet; ore consists of sulphide of iron and copper; and in upper part of the vein the ore is oxidized and shows free gold in panning; 8-ton Huntington mill. Idle at present.

Bibl.: Bull. No. 50, p. 144.

Black Palangus, in Sec. 36, T. 1 N., R. 6 E., H. M. Owners Hutchens Brothers. Open cuts; croppings are bold and 20 feet wide; some of the ore, sulphide of iron and copper, assays 17% copper. Idle.

Cinderella, in Sec. 9, T. 37 N., R. 7 W., M. D. M., in Trinity Center mining district. Owners, P. A. and E. A. Wagner, of Carrville. Comprises 2 claims; 300 feet of tunnels and 50-foot shaft; vein said to be 16 feet wide and to carry 10% copper; serpentine is the country rock; joins Copper Queen on the north.

Copper Button, in Sec. 36, T. 37 N., R. 7 W., in the Trinity mining district. Owners, Osborne & Baker. Comprises 4 claims; developed by short tunnels and open cuts; ore, which is high-grade, occurs in connection with dikes of quartz-porphyry in serpentine, and consists of oxides, carbonates and sulphides. Idle.

Bibl.: Bull. No. 50, p. 145.

Copper Queen, in Sec. 16, T. 37 N., R. 7 W., in the Trinity Center mining district. Leased to G. H. Fitch. Comprises 3 claims; short tunnels and shaft; ore occurs in serpentine and consists of oxides and carbonates of copper, with a little sulphide at the lower levels.

Bibl.: Bull. No. 50, pp. 145–146.

Copper Queen, in Secs. 10 and 11, T. 1 S., R. 6 E., H. M., 35 miles southeast of Bridgeville, Humboldt County. Owner, J. Hutchens. Comprises 6 claims; developed by a 40-foot tunnel and open cuts; ore consists of sulphide of iron and copper; strong gossan croppings. Idle.

Crown Point, in Sec. 18, T. 37 N., R. 7 W., in Trinity Center mining district. Owner, G. L. Carr, of Carrville. Ore body is wide and extensive; short tunnel and open cuts. Idle.

Bibl.: Bull. No. 50, p. 145.

Eureka, in Secs. 17 and 18, T. 37 N., R. 7 W., in the Trinity Center mining district. Owners, Dimmock & Hoefler, of Carrville. Comprises 2 claims; 50-foot tunnel; siliceous ore carrying a small percentage of copper sulphide. Idle.

Fortuna, in T. 1 S., R. 6 E., near the Copper Queen. Owner, Fortuna Mining Company, of Fortuna, Cal., C. Sweet, president. Holdings consist of 19 claims, about 30 miles from Bridgeville. Only slightly developed with open cuts and short tunnels. Conspicuous gossan croppings on claims. Ore is a sulphide of iron and copper. Idle.

Granite, on Quimby Creek, 6 miles above its mouth, in Trinity Reserve. Owners, F. C. Patton et al., of Weaverville; 7 claims; ore occurs in serpentine and slate; some of the ore carries 25% copper, with some gold; only little development work; facilities for mining are good.

Bibl.: Bull. No. 50, p. 143.

Photo No. 1. Island Mountain Consolidated; croppings and improvements.

Island Mountain Consolidated, in Secs. 9, 10 and 15, T. 5 S., R. 6 E., in the Horseshoe mining district, 90 miles north of Ukiah. Owners, Leach and Wilcox, of Oakland, Cal. Comprises 275 acres along the Eel River; elevation 750 feet; located in 1892; ore, iron sulphides, carrying copper, iron and zinc, occur in lenses between sandstone walls; strike northwest and southeast; greatest depth 145 feet; workings consist of 400-foot tunnel and 2000 feet of drifts; claim 300,000 tons of ore in sight; croppings in places 180 feet wide, and can be traced for 500 feet; equipment consists of dwellings and shops; only little work done since 1895; about $20,000 has been spent in development work. The Northwestern Pacific Railroad is being built on a portion of this property and ore will be shipped to a smelter as soon as the road is completed. Largest copper mine in Trinity County. (See photo No. 1.)

Bibl.: Bull. No. 50, p. 148.

Jackson & Carter, in Sec. 29, T. 31 N., R. 10 W., 8 miles southeast of Hay Fork. Owners, Carter & Jackson. Comprises 4 claims; 40-foot shaft; lode 10 feet wide; can be traced only a short distance; ore consists of sulphide of iron and copper, said to assay 10% copper. Idle.

Lone Pine, in Sec. 19, T. 1 N., R. 8 E., H. M., near the mouth of Rattlesnake Creek. Owners, D. and M. Murphy. Holdings consist of two claims. Only slightly developed. Ore occurs in diorite, and is a copper sulphide. Idle.

Bibl.: Bull. No. 50, p. 142.

Murphy, in Sec. 36, T. 1 N., R. 7 E., H. M., in the Hyampom Valley. Owners, M. and D. Murphy. Three shafts and one tunnel over 400 feet long. Ore occurs in serpentine, in veins of white feldspathic rock, carrying high grade oxides, carbonates and sulphide. Idle.

Bibl.: Bull. No. 50, p. 142.

Nonpareil, in Sec. 5, T. 36 N., R. 12 W., 3 miles southeast of Couer, in the Trinity Reserve. Owner, C. S. McAtes, of Redding; short tunnel on the property; lode varies from 1 to 14 feet in width, but can not be traced continuously for any distance; gossan croppings in places for a mile along its strike; ore said to average 8% copper. Idle.

Bibl.: Report XIII, p. 64; Bull. No. 50, p. 143.

Quimby, on Quimby Creek, in the Trinity Reserve, owned by the Quimby Mining Company; six claims; vein 4 feet wide; sulphide, iron and copper, is oxidized near the surface and was milled; two tunnels, 100 and 400 feet in length; 300 feet of drifts. Idle.

Bibl.: Bull. No. 50, p. 144.

Vine Oak, consists of two claims, in Secs. 2 and 35, T. 1 N. and 1 S., R. 7 E., owned by I. P. Collins, Hay Fork. Ore consists of copper sulphide, carrying some gold, and occurs in diorite. Slightly developed by means of short tunnels.

Bibl.: Bull. No. 50, p. 143.

GOLD.

Native gold is the principal valuable mineral of the veins, as the sulphides form only a small part of the total volume. The fissure veins are usually associated with dikes of soda-granite porphyry. The veins are persistent both in dip and strike, and below a shallow zone of surface enrichment show no marked change in character with depth. The pocket deposits are usually found along faulted contacts of the slate and meta-andesite. The vein filling consists of quartz and calcite, with small amounts of galena, sphalerite and arsenopyrite, as well as free gold.

MINING DISTRICTS.

Canyon Creek Mining District, famous in the early days for its rich placers, both creek and bench, is now being developed for quartz. This creek heads in the Salmon Range in T. 39 N., R. 10 W., and flows south and empties into the Trinity River at Junction City in Sec. 12, T. 33 N., R. 10 W. The formation in this region consists of hornblende schist and granite-porphyry. The first quartz location was made in 1889, on the Chloride, now one of the claims of the Globe group.

Bibl.: Report X, pp. 710–711; Bull. No. 540, pp. 76–78, U. S. G. S.

Coffee Creek, one of the main tributaries of the Trinity, heading in the Granite Mountains of the Salmon River and flowing easterly through townships 37 and 38, has been worked for years for placer gold. The topography of the section between the headwaters of this creek and the Salmon River, in Siskiyou County, indicates that the river formerly had an outlet through Coffee Creek channel to the valley of the Trinity. Quartz mining has been diligently pursued along Coffee Creek and its tributaries, in recent years, and several high-grade producers developed.

Bibl.: Report X, p. 697.

Deadwood Mining District, is situated on the western slope of the Trinity range, in T. 33 N., R. 8 W., and is a continuation of the French Gulch mineral belt. Brown Bear is the famous quartz mine in this district.

Bibl.: Report X, pp. 713–714; U. S. G. S. Bull. No. 540, pp. 69–71.

In the *East Fork Mining District,* the formation is mainly granitic gneiss and mica schists, overlying the true granite, and the quartz veins seem to be incased in the strata between the primary and metamorphic rocks. In portions of this district the stratified rocks are much contorted, giving the veins very uncertain courses or dips, being especially noticeable in the Enterprise mine, where the vein has been disturbed and broken and is resting on the formation as a blanket ledge. The mica of the gneiss and schist is of a silvery white (muscovite), in places the mica entering the quartz, forming a quartz schist, and in such cases the vein yielded to the granitic rocks and pinched out. The Enterprise is the most active quartz mine in this district.

Bibl.: Report X, p. 710.

The Minersville District includes the country along the Trinity River between Trinity Center and Papoose Creek.

The contact between meta-andesite and slate has furnished rich pocket deposits, especially in the vicinity of the old town of Minersville. Much gold has also been supplied to the placers of this neighborhood from the same source.

The Five Pines is the most active quartz mine in this district at the present time.

Bibl.: U. S. G. S. Bull. No. 540, pp. 73–76.

Stewart's Fork, heads in the Salmon Mountains in T. 37 N., R. 10 W., and flows southeasterly, emptying into the Trinity River in T. 34 N., R. 9 W. On Deer Creek, one of the tributaries to Stewart's Fork, several quartz locations have been made, but only a small amount of development work has been done. This region presents a promising field for the prospector. The formation consists of granite, with slate, and also large belts of dolomitic limestone in contact with the serpentine from the northeast; the quartz is white, containing sulphurets of arsenical iron, galena, copper and zinc; but little free gold is detected by panning.

Bibl.: Report X, p. 713.

Trinity Center Mining District, noted for the richness of its auriferous gravels, was settled in 1851. The deposits of gravel are in the form of benches caused by old river channels, and are about 1 mile in width, varying in depth from 20 feet on the lower to 80 feet on the upper benches, being a section of the flow of gravel from Coffee Creek to the Weaver Basin. Dredging operations are being successfully pursued near the town of Trinity Center. A large area of placer ground along the Trinity River between Trinity Center and Carrville, affords an excellent dredging field.

Bibl.: Report X, p. 698; Bull. No. 540, p. 19, U. S. G. S.

GOLD MINES—QUARTZ.

Alaska, in Sec. 15, T. 35 N., R. 11 W., in the East Fork mining district, 10 miles northeast of North Fork. Owners, W. F. Jenkins et al. Comprises 40 acres, at an elevation of 3100 feet; ore shoot is 340 feet long and 2½ feet wide between slate walls; 560-foot tunnel and 1500 feet of drifts; 1 stope (100 feet by 4 feet by 80 feet); old 13-foot arrastra used for milling purposes; ore is free milling and rich; said to have produced $600,000; several years since property has been worked; no ore in sight.

Bibl.: Report XIII, p. 437.

Amy Balch, in Sec. 13, T. 33 N., R. 8 W., in the Deadwood mining district, 1 mile south of Deadwood. Owner, M. G. Carter. Comprises 60 acres, at an elevation of 3400 feet; ore shoot is 110 feet long and 16 inches wide, free milling and high grade, between walls of quartz-porphyry; strike of vein S. 40° E.; dip 40° N.; greatest depth 140 feet; workings consist of 540-foot tunnel, 400 feet of drifts, 90-foot raise and 1 stope 50 feet by 3 feet by 90 feet; equipment consists of cars, dwellings and 9-foot arrastra run by waterpower from Thorne Gulch, through a ditch 1 mile long; 2 men are employed doing prospect work; said to have produced $60,000.

Bibl.: Report XIII, p. 437.

Armstrong, in Sec. 6, T. 37 N., R. 12 W., in the New River mining district, ¾ mile north of Denny, in the Trinity Reserve. Owner, J. E. Miller. Comprises 40 acres; located in 1890; small vein in quartz-porphyry; 210-foot tunnel; little high-grade taken out on the surface. Idle.

Bibl.: Report XIII, p. 437.

Big Chief, in Sec. 16, T. 8 N., R. 8 E., in the New River mining district, 2 miles south of Denny in the Trinity Forest Reserve. Owners, Ladd Brothers. Comprises 40 acres; located in 1908; elevation 3800 feet; extent of ore shoot not determined, but exposed continuously in tunnel, 100 feet long; walls are schist; width of vein 14 inches; ore runs from $15 to $60 per ton; good prospect; one man working.

Bigelow, in Secs. 15 and 16, T. 34 N., R. 10 W., in the Canyon City mining district, 1½ miles southeast of Dedrick, in the Trinity Forest Reserve. Owner, J. E. Henry. Comprises 20 acres; short ore shoot in hornblende-schist and granodiorite; 70-foot shaft; little high-grade extracted; endeavoring to find ore shoot beyond a fault; 2 men employed.

Blue Jacket, in Secs. 17 and 18, T. 37 N., R. 7 W., in the Trinity Center mining district, 1½ miles northwest of Carrville, in the Shasta

Reserve. Owner, Adams Exploration Company, an eastern corporation. G. L. Carr, superintendent. Comprises 450 acres; ore shoot 200 feet long and 5 feet wide; strike N. 40° E.; dip 40° SE.; footwall is serpentine and hanging-wall is quartz-porphyry; maximum depth, 320 feet. Workings: Tunnel 820 feet long, drifts, raises and stopes. Equipment: Cars, dwellings, blower, 5-stamp mill, driven by water-power from Coffee Creek through ¾ mile of flume; 3 men employed; some ore in sight; producer at one time; ore free milling, but low-grade, with rich spots occasionally.

Bibl.: Report XIII, p. 439.

Blue Jay, in Sec. 13, T. 37 N., R. 8 W., in the Trinity Center mining district, 2½ miles west of Carrville, in the Shasta Forest Reserve. Owner, M. McIllwain. Comprises 40 acres; located in 1886; 2 veins in quartz-porphyry; short ore shoot 16 inches wide; tunnels 500 feet long and 200 feet of drifts; little high grade extracted. Idle.

Blue Jay, formerly known as Knob, in T. 33 N., R. 8 W., in the Lewiston mining district, 4¾ miles northeast of Lewiston. Owners, Paulson & Gifford. Comprises 40 acres on Eastman Gulch; ore shoot 80 feet long and 1 foot wide; high-grade stringers running from vein; 480-foot tunnel, 200 feet of drifts, 100-foot raise to surface from tunnel and 1 stope 40 feet by 3 feet by 100 feet; equipment consists of cars, blacksmith shop and dwelling; 2 men employed; ore reduced in the Venicia mill.

Bonanza, in Sec. 9, T. 35 N., R. 11 W., in the East Fork mining district, 13 miles northeast of North Fork by trail, in Trinity Reserve. Owner J. L. Johnston. Comprises 40 acres at an elevation of 3000 feet; 320-foot tunnel and 500 feet of drifts and raises; ore free milling and shoot 300 feet long and 4 feet wide; little rich ore extracted. Idle at present.

Bonanza, in Sec. 29, T. 35 N., R. 8 W., in the Minersville mining district, ¾ mile north of Minersville, in the Trinity Reserve. Owner J. H. Tourtellate. Comprises 40 acres, located in 1890; elevation 2700 feet; short ore shoot, free milling and high grade, in slate; 130-foot incline shaft, 200-foot drift and 60-foot tunnel; $15,000 extracted from pockets. Idle at present.

Bibl.: Report XIII, p. 439.

Brown Bear, in Secs. 11 and 12, T. 33 N., R. 8 W., in the Deadwood mining district, in the old town of Deadwood, is the most famous quartz mine in Trinity County, having been a producer since 1875. It is owned by the Brown Bear Mining Company of Redding. Thos. McDonald, president; B. McDonald, superintendent. Comprises 586 acres of quartz locations of which 200 are patented and 671 acres of

timber land; number of veins, two—Monte Cristo and Last Chance; free milling; ore shoot 600 feet long and 2 feet wide; strike east and west; dip 60° E.; walls are slate; workings consist of seven tunnels from 100 to 2400 feet in length, the main workings being on the Last Chance and Ned Roberts claims; greatest depth on vein, 750 feet; over 3000 feet of drifts and several stopes (200 feet by 4 feet by 200 feet); equipment: cars, dwellings, assay office and 10-stamp mill and two Wilfley tables, driven by waterpower from Deadwood Creek through a 3-mile ditch; four men employed at present, one on top and three in the mine; five men are leasing from the company; a production record of $8,000,000 is claimed.

Bibl.: Report VIII, p. 639; X, p. 713; XII, p. 308; XIII, pp. 440–441. U. S. G. S. Bull. No. 540, pp. 70–71.

Buck, in Sec. 14, T. 32 N., R. 9 W., in the Indian Creek mining district, 4½ miles southeast of Douglas City. Owner, J. W. Phillips. Comprises 40 acres; located in 1890; short ore shoot, 6 inches wide, in slate; 210-foot tunnel, 200 feet of drifts and a stope, 40 feet by 3 feet by 50 feet; some high grade near the surface; ore somewhat rebellious as depth is attained; old 9-foot arrastra. Idle.

Bully Choop, in Secs. 5, 8, 9 and 4, T. 31 N., R. 8 W., in the Indian Creek mining district, 16 miles southeast of Douglas City. Owner, Bully Choop Gold Mining and Power Company of Atlanta, Georgia, J. F. Beck, president. Comprises 588 acres, of which 198 are patented. Length of pay shoot, 230 feet; width, 6 feet; strike east and west; dip 40° S.; walls quartz-porphyry; greatest depth, 320 feet; workings, several tunnels, longest being 1700 feet, several thousand feet of drifts, raises and stopes; ore, free milling, but becomes somewhat base as depth is attained; water for power obtained from north and south forks of Indian Creek, through a 3-mile ditch. Equipment: cars, dwellings, sawmill, electrical plant, telephone line (15 miles long), and 30-stamp mill driven by water and electrical power; has been a producer; some ore reserve in the mine. Idle at present.

Bibl.: Report VIII, pp. 640-641; XII, p. 308; XIII, p. 441.

Carrie, in Sec. 5, T. 37 N., R. 12 W., in the New River mining district, 3 miles northeast of Denny, in the Trinity Reserve. Owner, G. Ferney. Comprises 20 acres at an elevation of 4600 feet; small vein, in diabase; 380 feet of tunnels and 300 feet of drifts; ore high grade; some rich pockets found; produced $16,000. Worked by lessee.

Chapman, in Sec. 33, T. 38 N., R. 8 W., in the Trinity Center mining district, 7 miles northwest of Carrville, in the Shasta Forest Reserve. Owner, W. Chapman. Comprises 60 acres, at an elevation of 3700 feet; ore shoot is 80 feet long and 2 feet wide, in serpentine:

220-foot tunnel, 130-foot drift and 40-foot winze; 5½-foot Huntington mill, run by both steam and waterpower; 20 h.p. boilers; two men employed; some high grade ore; said to have produced $20,000.

Cleveland, in Secs. 4, 9 and 16, T. 31 N., R. 8 W., in the Indian Creek mining district, 15 miles southeast of Douglas City. Owner, Cleveland Consolidated Mining Company, of Red Bluff, Cal., R. G. Hart, president. Comprises 100 acres, patented, at an elevation of 5800 feet; 12-mile trail to mine; 300-foot ore shoot, 7 feet wide; low grade and base as depth is attained; greatest depth, 220 feet; 460-foot tunnel and 300 feet of drifts. Idle. Said to have a small production record.

Craig, formerly known as the *Mason and Thayer,* in Secs. 4, 5, 32 and 33, T. 34 and 35 N., R. 10 W., in the Canyon Creek mining district, 3 miles northeast of Dedrick, in Trinity Reserve. Owner, Craig Mining Company, F. M. Craig, president and manager; H. C. Stofer, superintendent. Comprises 100 acres, acquired by this company in 1911; elevation 4200 feet; length of ore shoot, 400 feet, width 4 feet; length driven on vein, 830 feet; depth on vein, 420 feet; three tunnels, on vein, from 100 to 830 feet in length, with drifts and crosscuts, comprise several hundred feet of development work; walls are hornblende schist; strike of vein northwest and southeast; dip 60° N.; equipment consists of cars, dwellings and assay office; number of men employed—top, four; mine, eight; total twelve; considerable tonnage of ore blocked out, all free milling; one of the best properties in the district, ranking next to the Globe; excavation made for a 20-stamp mill.

Bibl.: U. S. G. S. Bull. No. 540, p. 78.

Dixie Queen, in Secs. 14 and 23, T. 32 N., R. 9 W., in the Indian Creek mining district, 5 miles southeast of Douglas City. Owners, Morris Brothers. Comprises 20 acres, at 2700-foot elevation; small vein, high grade and free milling, in slate; 150-foot tunnel and 100-foot drift; two men employed; about $10,000 taken out in pockets.

Enterprise, in Secs. 4 and 5, T. 35 N., R. 11 W., in the East Fork mining district, 7½ miles north of North Fork, in the Trinity Forest Reserve. Owner, Enterprise Gold Mining Company, of Boston, Mass., Geo. S. Fenwick, secretary; comprises 160 acres, the first claim, Lone Jack, being located in 1882, and mine has been operated more or less continuously ever since; number of veins, 1; ore free milling and of good grade; length of pay shoots—three shoots—900, 300 and 300 feet, and average width of 14 inches; strike northeast and southwest; dip from 10° to 45° NW.; diorite walls; several tunnels, one being 1400 feet long; 3000 feet of drifts and crosscuts; three stopes, 500 feet by 5 feet by 50 feet, 900 feet by 5 feet by 200 feet, and 300 feet by 5

feet by 240 feet; greatest vertical depth, 500 feet; equipment: cars, 5 machine drills, Compressor plant, Cameron pump, small electric plant, sawmill, assay office, dwellings and small underground winch; 10-stamp mill, run by waterpower, 1 Frue and 1 Woodbury table; number of men employed, mine 10, mill 2, total 12; production to date, over $350,000; cost over $7 per ton for operating; mine leased to Skinner & Day, who milled 1300 tons and saved $20,000 on the plates; considerable ore blocked out; some of the ore carries tellurium.

Bibl.: Report VIII, p. 643; X, p. 710; XI, p. 482; XIII, p. 446.

Eureka, in Sec. 33, T. 35 N., R. 10 W., in the Canyon Creek mining district, 3 miles south of Dedrick. Owner, Maple Creek Mining Company, of Weaverville; L. E. Smith, president; P. Flathery, superintendent; comprises 120 acres; 200-foot ore shoot, 3 feet wide, between schist and porphyry walls; 400-foot tunnel and stope (60 feet by 4 feet by 80 feet) on Gray Eagle Claim; ore worked in arrastra at one time; 2 men employed, doing assessment work.

Excelsior, in Secs. 5 and 8, T. 37 N., R. 12 W., in the New River mining district, 2½ miles northeast of Denny, in the Trinity Forest Reserve. Owners, Harris & Colegrave; comprises 80 acres, at an elevation of 4800 feet; ore shoot 300 feet long and 18 inches wide; between granite walls, maximum depth 315 feet; strike northwest and southeast; dip N. 50° E.; two tunnels, one on vein having a length of 700 feet and the crosscut 240 feet; 1600 feet of drifts, several raises and stope (100 feet by 3 feet by 90 feet); old 2-stamp mill; said to have produced $160,000; only high grade ore worked. Idle.

Bibl.: Report XIII, p. 446.

Fairview, in Sec. 3, T. 34 N., R. 8 W., in the Minersville mining district, 1½ miles southeast of Minersville, in the Trinity Forest Reserve. Owner, Fairview Mining Company, of San Francisco; Charles Allenberg, president; H. Waldo, superintendent; comprises 320 acres, of which 160 acres are patented; elevation 3000 feet; strong fissure vein, in slate; strike northeast and southwest; dip 40° S.; ore shoot is 500 feet long and 3 feet wide; greatest depth on vein, 450 feet; workings consist of 4 tunnels from 150 to 1500 feet in length, all connected with a raise and 2 stopes (100 feet by 4 feet by 140 feet); equipment consists of cars, 1000 feet of automatic tramway, assay office, dwellings and 40-stamp mill, driven by waterpower; water obtained from Stewart Fork, through a ditch five miles long; production $500,000, from 1900 to 1907, and during this time 100 men were employed; since 1907 it has been worked by lessees.

Bibl.: U. S. Geol. Surv. Bull. No. 540, pp. 75–76.

Five Pines, in Secs. 20 and 29, T. 35 N., R. 8 W., in the Minersville mining district, two miles northwest of Minersville, in the Trinity Reserve; owner, Five Pines Mining Company, of Minersville, H. J. Van Ness, president; L. Van Ness, manager; located in 1896; length of ore shoot not determined; ore occurs in meta-andesite and slate, and is free milling and high grade; workings consist of incline shaft, 225 feet deep, one level with 90-foot drift and 1 stope (100 feet by 3 feet by 60 feet); equipment, small hoist, cage, dwelling and 2-stamp mill; waterpower used; 4 men employed; production to date, $275,000; coarse gold and 80 per cent of the total value recovered in hand mortar and pan; rich pockets occur along the water courses; in a vertical depth of 44 feet, $45,000 was extracted from one pocket; other pockets run from $10,000 to $15,000; surface ore is honeycombed and stained with manganese oxide; best producer in this district.

Bibl.: U. S. Geol. Surv. Bull. No. 540, pp. 73–74.

Forget-Me-Not, in Secs. 8 and 9, T. 37 N., R. 7 W., in the Trinity Center mining district, 1½ miles northeast of Carrville, in the Shasta Reserve. Owner, Carr Estate; comprises 34 acres, at an elevation of 3500 feet; ore shoot 100 feet long and 2 feet wide, free milling; footwall is diorite and hanging-wall quartz-porphyry; strike N. 40° E., dip 20° S.; workings: tunnel 1000 feet long, 400 feet of drifts from old shaft (100 feet deep), two stopes 40 feet by 3 feet by 50 feet; equipment: cars, dwelling, 50-h.p. boiler, 5-stamp mill driven by steam and water power; some high grade ore worked in an arrastra years ago; producer at one time; bonded to Adams Exploration Company. Idle at present.

Bibl.: Report XIII, p. 446.

Fountain Head, in Sec. 4, T. 34 N., R. 11 W., in the North Fork mining district, 5 miles north of North Fork. Owner, R. Ellson; comprises 40 acres, reached by trail from North Fork; short ore shoot in slate; ore free milling and high grade; 460-foot tunnel, drifts and stope; old 5-stamp mill, steam driven (idle); said to have produced over $50,000; ore reserve worked out; idle at present.

Bibl.: Report XIII, p. 447.

Four Point, in Sec. 32, T. 35 N., R. 10 W., in the Canyon Creek mining district, 3 miles north of Dedrick, in the Trinity Reserve. Owner, H. C. Stofer et al.; comprises 40 acres, located in 1894; 150-foot tunnel, all in ore, 15 inches wide; hornblende schist and quartz-porphyry walls; building a 12-foot arrastra to be operated by water from Chloride Gulch; three owners working.

Globe, in Secs. 15, 16 and 21, T. 35 N., R. 10 W., in the Canyon Creek mining district, 4 miles north of Dedrick, in the Trinity Reserve.

Owner, Globe Consolidated Mining Company, a Canadian corporation; J. B. Goodyear, president; T. M. Craig, secretary; W. Macgreagor, superintendent; comprises 200 acres, acquired in 1910, and includes the old Bailey, Chloride and Globe groups; elevation, 6100 feet; length of ore shoot, 600 feet; width 6 feet; strike northeast and southwest; dip 60° E.; walls, hornblende schist; number of veins, 4: Chloride, Bailey,

Photo No. 2. Globe Mine; 20-stamp mill.

Globe and Boyd; free milling ore; length driven on vein, 1700 feet; greatest depth on vein, 620 feet; 6 tunnels in all, from 250 to 1700 feet long; several thousand feet of tunnels, crosscuts, drifts and stopes; one stope is 200 feet by 6 feet by 40 feet (filled with waste); large tonnage blocked out in mine; mine equipment: cars, compressor plant, electrical plant, sawmill, dwellings, assay office, executive offices;

reduction equipment: 20-stamp mill just completed (direct cyaniding), 100-ton cyanide plant, tubemill, 5600-foot automatic-gravity tramway from mine to the mill, 500-ton bins; water power used from Canyon Creek; plant complete cost over $300,000; number men employed: top 85, mine 25, total 110; property said to have produced $700,000 before acquired by this company. (See photos Nos. 2 and 3.)

Bibl.: Reports X, p. 711; XI, p. 483; XII, pp. 309, 310; XIII, p. 447; U. S. Geol. Surv. Bull. No. 540, pp. 76–78.

Photo No. 3. Globe Mine; section of flume.

Golden Chest, in Sec. 9, T. 35 N., R. 11 W., in the East Fork mining district, 13 miles northeast of North Fork, by trail, in Trinity Reserve. Owners, Boyce et al.; comprises 40 acres, at an elevation of 3300 feet; ore shoot, 300 feet long and 2 feet wide; fissure vein, with slate walls; strike east and west; dip 40° S.; 490-foot tunnel, several hundred feet of drifts and stopes; only worked to a shallow depth, 150 feet; free milling ore of good grade; equipment: cars, dwellings, 5-stamp mill (old 750-pound stamps), and 4 concentrators; idle for several years; some rich ore worked at one time and property said to have produced $200,000.

Bibl.: Reports X, p. 711; XIII, p. 447.

Golden Jubilee, in Sec. 10, T. 37 N., R. 8 W., in the Trinity Center mining district, 8 miles southwest of Carrville, in the Shasta Reserve. Owner, Coffee Creek Mining and Milling Company, of Redding; R. M. Saeltzer, president; J. Boedecker, superintendent; comprises 150 acres, patented; elevation, 3200 feet; length of ore shoot, 140 feet; width, 2½ feet; strike northeast and southwest; dip 40° E.; footwall slate,

and hanging-wall diorite; workings consist of tunnel 750 feet long, several hundred feet of drifts, raises and stopes; equipment: cars, dwellings, blower and pipe, assay office, and 10-stamp mill driven by steam and water power (idle); 50-h.p. boiler; 5 men employed in mine; some high grade ore extracted; paid some dividends; said to have produced $250,000.

Hardtack, in Sec. 6, T. 37 N., R. 12 W., in the New River mining district, 1 mile north of Denny, in the Trinity Reserve. Owner, T. J. Ladd; comprises 40 acres, located in 1889; elevation 4700 feet; ore shoot 80 feet long and 18 inches wide, in quartz-porphyry; 320-foot tunnel; little high grade ore extracted; only do assessment work.

Bibl.: Report XIII, p. 448.

Hard Times, in Sec. 6, T. 37 N., R. 12 W., in the New River mining district, 3 miles north of Denny, in the Trinity Reserve. Owner, E. C. Miller; comprises 60 acres, at an elevation of 4400 feet; ore shoot 100 feet long and 2 feet wide in diabase; 210-foot tunnel and 400 feet of drifts; some rich ore extracted; said to have produced $20,000; worked at times by lessees. Idle.

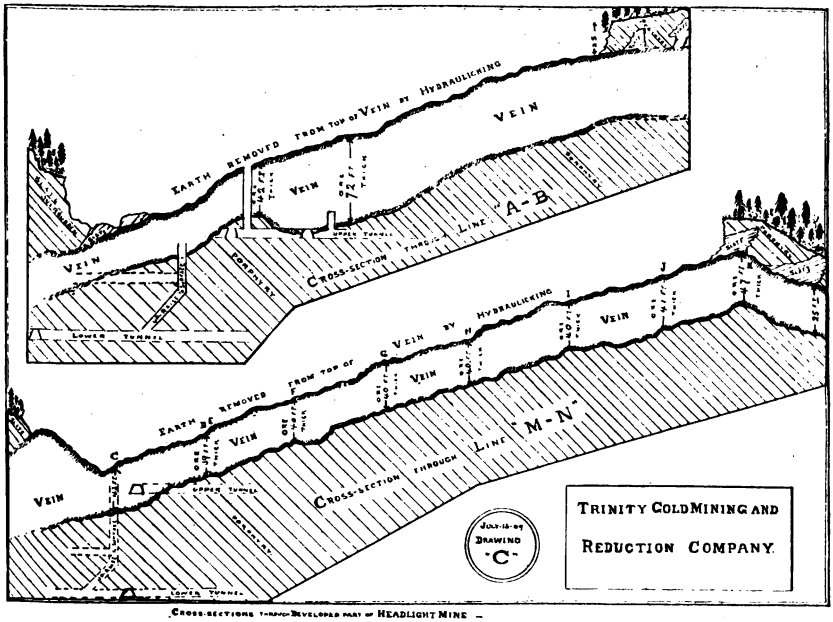
Bibl.: Report XIII, p. 448.

Hay Fork Mining and Milling Company, in T. 31 N., R. 11 W., about 3½ miles southeast of Hay Fork. Owner, Dr. Mueller et al., of Redding; comprises 100 acres, at an elevation of 3400 feet; 2 veins in schist; short ore shoot; 3 tunnels, from 60 to 230 feet in length; little high grade extracted. Idle.

Headlight, in Secs. 20 and 21, T. 37 N., R. 7 W., 1½ miles southeast of Carrville, has the largest reduction plant in Trinity County. It is owned by the Trinity Gold Mining and Reduction Company, of New York; H. W. Miller, president; J. H. Lee, secretary; D. W. Shanks, general manager; D. Goodale, superintendent; comprises 423 acres, of which 320 acres are patented; in the Shasta Reserve; elevation, 3500 feet; ore shoot, 600 feet long and 35 feet wide, with several deposits, also; strike east and west; dip 22° N.; footwall, andesite, and hanging-wall, slate; maximum depth, 200 feet; workings consist of several tunnels, one being 350 feet long, open cuts, raises and drifts, comprising several thousand feet of development work; ore free near the surface, but base with depth, containing iron and copper sulphides (see map-drawing "C"); company claims 300,000 tons at value of $6 per ton, as an ore reserve; mine equipment: cars, tools, 2 giants and pipe, shops, 700 h.p. electrical plant, with 2 miles of power line, assay office, sawmill, and dwellings; reduction equipment: 40-stamp Hendy mill, electrically driven, and 250-ton cyanide plant, constructed in 1910, and idle at present, as values can not be saved

and experiments have been made so far without success; 8 men are employed; production to date, $500,000, in two years; ore runs from $6 to $8 per ton; total operating cost per ton, from $2.10 to $2.40; electric plant is on Coffee Creek; one of the best equipped quartz mines in the county.

Bibl.: Report XIII, p. 449.



Headlight Mine, Trinity County, California.

Hunter, in the New River mining district, 40 miles by trail from Helena, in Trinity Reserve. Owner, J. P. Hennessy; comprises 120 acres, located in 1888; elevation 4500 feet; extent of ore shoot not determined; can be traced for 400 feet on the surface; workings consist of 500-foot crosscut tunnel and 600 feet of drifts, 1 stope and 60 and 80 foot raises; equipment: cars, dwellings, 10-stamp mill (850 lb. stamps), one Frue vanner run by steam power; vein is spotted, with high grade found at times; idle since June, 1912; 9 men employed when in operation; small producer.

Bibl.: Report XIII, p. 450.

Isabel, in Sec. 32, T. 35 N., R. 10 W., in the Canyon Creek mining district, 2½ miles north of Dedrick, in the Trinity Reserve. Owner, T. E. Martin; comprises 60 acres; short ore shoot in granite; 210 and 90 foot tunnels; said to have produced some high grade ore. Idle.

Jacoby, T. 33 N., R. 9 W., about 6 miles northeast of Lewiston, on Eastman Gulch. Owners, Goodyear & Richards; comprises 80 acres,

located years ago; ore shoot is 100 feet long and 14 inches wide, free milling and good grade; footwall is slate and hanging-wall quartz-porphyry; strike northwest and southeast; dip 15° S.; workings consist of 550-foot tunnel, 400 feet of drifts, and 1 stope, 60 feet by 3 feet by 90 feet; greatest depth on vein is 200 feet; equipment consists of cars, dwelling and 2-stamp Hendy mill (1000-lb. stamps), driven by waterpower from Eastman Gulch through a ditch ¾ mile long; best ore in pockets and worked for high grade; a production of $50,000 is claimed; leased to Paulson Brothers; idle at present.

Jerusalem, in Sec. 9, T. 31 N., R. 8 W., in the Indian Creek mining district, 10 miles west of Ono, by trail. Owner J. T. Lockhard; comprises 80 acres; ore shoot is 200 feet long and 2 feet wide; 560-foot tunnel and 300 feet of drifts; some rich ore extracted at one time; idle for several years.

Bibl.: Report XIII, p. 450.

Lapman, in Sec. 12, T. 33 N., R. 8 W., in the Deadwood mining district, ¾ mile north of Deadwood. Owner, Calumet-Michigan Mining Company, of Detroit; comprises 60 acres, on Thorne Gulch; ore shoot is 100 feet long and 10 inches wide; slate footwall, and quartz-prophyry hanging-wall; 3 tunnels on vein from 50 to 450 feet long and 300 feet of drifts; little high grade ore extracted; being worked by George Bacon, on a lease, who is prospecting for "high grade."

Last Chance, in T. 33 N., R. 8 W., in the Lewiston mining district, 5 miles northeast of Lewiston. Owners, Newland & Dean. Comprises 60 acres on Eastman Gulch; small vein, high grade, in slate; 220-foot tunnel, 250 feet of drifts, and 1 stope; equipment consists of cars and dwellings; worked for "pockets"; claim a production of $20,000. Idle at present.

Laurel, in Sec. 14, T. 32 N., R. 9 W., in the Indian Creek mining district, 4 miles southeast of Douglas City. Owner, C. E. Connor. Comprises 20 acres; located in 1893; small vein; worked for pockets; rich bunch taken out near surface; 180-foot tunnel. Idle.

Layman, formerly known as *Horseshoe,* in Sec. 33, T. 32 N., R. 11 W., in the Hay Fork mining district, 2 miles north of Hay Fork. Owner, Estate of J. B. Layman. Comprises 120 acres, at an elevation of 2900 feet; 2 parallel veins, about 400 feet apart; short ore shoot in schist; 3 tunnels, 280, 85 and 60 feet in length; little high grade found. Idle.

Maple, in Sec. 1, T. 34 N., R. 11 W., 4 miles south of Dedrick, in the Canyon Creek mining district, in Trinity Reserve. Owner, T. E. Reed. Comprises 20 acres; located in 1894; 100-foot ore shoot, 12 inches wide, between slate and granodiorite walls; 230-foot tunnel, and 1 stope (30 feet by 3 feet by 40 feet); 12-foot arrastra, run by

15-foot overshot wheel, water being obtained from Canyon Creek through 1 mile ditch; worked as a pocket mine and about $10,000 produced. Owner does only assessment work.

Bibl.: Report XII, p. 312; XIII, p. 454.

Modoc, in Sec. 31, T. 9 N., R. 7 E., in the New River mining district, ½ mile north of Coeur, in the Trinity Reserve. Owner, G. W. Healey. Comprises 20 acres; located in 1889; ore shoot, 130 feet long and 14 inches wide, free milling and good grade; walls are diabase foot and granitic-porphyry hanging; strike is N. 30° W.; dip 50° S.; workings, 480 and 160-foot tunnels, 600 feet of drifts and stope (80 feet by 3 feet by 60 feet); equipment: dwelling and old 1-stamp mill (650-pound stamp), driven by waterpower from Eagle Creek through 1-mile ditch; some high grade ore worked, all free milling; said to have produced $20,000. Idle.

Mountain Boomer is the best producer in the New River mining district, but is very expensive to operate as supplies must be packed over a trail either from Hawkins Bar or North Fork, a distance of 40 miles from the latter town. It is located in Sec. 5, T. 37 N., R. 12 W., in the Trinity Reserve, at an elevation of 5000 feet. Owner, Bobs Farm Mining Company, of Sacramento; J. H. Byers, president; W. H. Montgomery, secretary. Comprises 100 acres; located in 1883; length of ore shoot 260 feet and width 2 feet; walls are hanging, diabase; foot, quartz-porphyry; strike east and west; dip 45° N.; maximum depth 700 feet; workings consist of several tunnels, longest being 1300 feet; 6 levels from 60 to 700 feet long, 2 crosscut tunnels 300 and 600 feet in length, several raises, winzes and stopes (60 feet by 3 feet by 120 feet), all comprising several thousand feet of development work; equipment: cars, dwellings, sawmill, assay office, and 3-stamp mill and one 3-foot Huntington, run by steam and waterpower; tailings impounded in brush dam; number of men employed—mine 10, mill 2, total 12; said to have produced $350,000; lessees are working the old dump running the ore through the two mills.

Bibl.: Report X, p. 715.

Nonpareil, in Sec. 9, T. 37 N., R. 7 W., in the Trinity Center mining district, 2 miles northeast of Carrville, in the Shasta Forest Reserve. Owners, Strode Brothers. Comprises 40 acres; 2 parallel veins; ore shoot 110 feet long and 2 feet wide; strike N. 40° E.; dip 40° E.; workings, tunnel on vein 420 feet long, 150 feet of drifts and 30-foot winze; ore free milling and some high grade found; said to have produced $20,000. Idle at present.

North Star, in Sec. 32, T. 35 N., R. 11 W., in the East Fork mining district, 8 miles north of North Fork, in the Trinity Reserve.

Owner, North Star Mining Company. Comprises 160 acres; located in 1884; 8 veins in all, being an extension of the Enterprise lode; strike northwest and southeast; dip S. 30° W.; length of ore shoot 300 feet, width 4 feet; free milling ore; walls are quartz-porphyry; 950-foot tunnel, drifts and stopes comprise several hundred feet of development work; greatest depth 400 feet; equipment: dwellings, 10-stamp mill driven by waterpower from east fork of North Fork of Trinity River through 1-mile ditch; ore bins, assay office; said to have produced $200,000. Idle at present.

Bibl.: Report XIII, p. 458.

Oriole, in Sec. 22, T. 32 N., R. 9 W., in the Indian Creek mining district, 4 miles southeast of Douglas City. Owner, A. L. Paulson. Comprises 40 acres; located in 1894; short ore shoot 1-foot wide, in slate; free milling; 140-foot tunnel and 80 feet of drifts; one stope, 40 feet by 3 feet by 40 feet; rotary mill, 5-foot bed (Cannon Ball mill), run by waterpower from Indian Creek; worked as a pocket mine; small producer. Idle at present.

Oro Grande, in Secs. 8 and 9, T. 37 N., R. 7 W., in the Trinity Center mining district, 2½ miles northeast of Carrville, in the Shasta Reserve. Owners, Strode Brothers. Comprises 50 acres; located in 1888; elevation 2600 feet; ore shoot 120 feet long and 3 feet wide, free milling; footwall is andesite and hanging-wall is quartz-prophyry; strike northwest and southeast; dip 40° NE.; maximum depth 400 feet; workings, 2600-foot tunnel, 600 feet of drifts, raises and stope (40 feet by 2½ feet by 80 feet); equipment: cars, 3-drill compressor plant, air blower, dwellings, 5-stamp mill (650-pound stamps), run by waterpower from Hosteller Gulch through 1 mile ditch; 2 men employed; some rich ore produced; pocket taken out in 1912.

Bibl.: Report XIII, pp. 458, 459.

Ozark, in Secs. 4 and 9, T. 34 N., R. 11 W., in the North Fork mining district, 5 miles north of North Fork. Owner, D. G. Reid. Comprises 40 acres. Short ore shoots 2 feet wide in slate; free milling and high grade; tunnel, 420 feet long, 500 feet of drifts and 1 stope (40 feet by 3 feet by 60 feet); old 10-foot arrastra; about $60,000 produced, mostly from pockets. Idle.

Bibl.: Report XIII, p. 459.

Quimby, in Sec. 22, T. 7 N., R. 13 W., in the New River mining district, ½ mile north of Quimby, in the Trinity Forest Reserve. Owner, Larson Brothers. Comprises 160 acres, located in 1902; elevation, 2260 feet; tunnel 150 feet on the vein, all in ore; 2 crosscut tunnels, upper 125 and lower 400 feet long with a 122-foot raise between them; 150 feet of drifts; equipment: cars, dwellings, 6-stamp Merrill mill, and

1 Huntington and 1 table similar to Wilfley, run by waterpower using 3 Pelton wheels; ditch 1½ miles long from Quimby Creek. Ore is base to some extent, carrying copper and arsenic, so that only a 50% extraction is obtained by direct amalgamation. Two men employed. Small producer.

Ralston, in Sec. 32, T. 35 N., R. 10 W., in Canyon Creek mining district, 2 miles northeast of Dedrick, in Trinity Forest Reserve. Owner, Trinity County Bank. Comprises 40 acres; ore shoot 200 feet long in granite and 2 feet wide; 4 tunnels from 50 to 385 feet in length on the vein; 1 stope (60 feet by 3 feet by 80 feet); 2-stamp mill driven by waterpower and steam. Production to date about $40,000. Two lessees working in main tunnel. Some high grade found.

Ray, in Sec. 12, T. 33 N., R. 8 W., in the Deadwood mining district, 1 mile west of Deadwood. Owners, Danners & Hollensworth. Comprises 80 acres, on Donnelly Gulch; small vein in diabase; worked for pockets; small producer at one time; 280-foot tunnel; 200 feet of drifts. Idle.

Bibl.: Report XIII, p. 460.

Reindeer, in Sec. 3, T. 37 N., R. 8 W., in the Trinity Center mining district, 5 miles north of Carrville, in the Shasta Reserve. Owner, Wagner Mining Company of Berkeley, Cal.; C. E. Wagner, president. Comprises 60 acres, at an elevation of 2900 feet; short ore-shoot in granite, 18 inches wide; tunnel 340 feet long and 200 feet of drifts. Two men employed. Ore free milling and of good grade.

Bibl.: Report XIII, p. 461.

Ridgeway, in Secs. 6 and 31, T. 37 and 38 N., R. 12 W., in the New River mining district, 1½ miles north of Denny, in the Trinity Reserve. Owner, Ridgeway Mining Company, of Weaverville; J. T. Jones, president. Comprises 80 acres, at an elevation of 4700 feet; ore-shoot 200 feet long and 1 foot wide; diabase walls, free milling; workings consist of 1000-foot tunnel, 400 feet of drifts, stopes (60 feet by 3 feet by 100 feet), and old incline shaft 200 feet deep (caved); maximum depth on vein, 400 feet; equipment consists of two 30 h.p. boilers, dwellings and old 10-stamp mill (750-pound stamps), run by steam power. Said to have produced $80,000. Worked by lessees at one time. All ore removed. Idle.

Bibl.: Report XIII, p. 461.

Silver Grey, in Sec. 33, T. 35 N., R. 10 W., in the Canyon Creek mining district, 2 miles northeast of Dedrick, in the Trinity Forest Reserve. Owner, R. L. Carter et al. Comprises 40 acres; ore shoot 70 feet long and 15 inches wide; 380-foot tunnel and 120-foot drift and 1 stope (60 feet by 3 feet by 50 feet); 5-foot Huntington mill driven

by waterpower; 1-mile ditch from east fork of Canyon Creek. Same high grade extracted. Production to date about $25,000. Two lessees working property at present.

Smith, in Secs. 30, 31 and 19, T. 36 N., R. 9 W., in the Weaverville mining district, 4 miles south of Weaverville. Owners, Paulson & Blake. Comprises 274 acres, at an elevation of 3900 feet; short ore shoot 2 feet wide; in granodiorite; 310-foot tunnel. Small pocket taken out on the surface. Idle. Only do assessment work. Vein not in place and greatest depth (70 feet) has not passed through the zone of disturbance.

Star of the East, in Sec. 13, T. 33 N., R. 8 W., in the Deadwood mining district, 1½ miles south of Deadwood. Owner, M. Brady. Comprises 20 acres, patented. Small vein in quartz-porphyry; some high grade extracted; 310-foot tunnel and several hundred feet of drifts. Idle.

Supplanter, located in Sec. 23, T. 7 N., R. 13 W., in the New River mining district, 2 miles north of Quimby. Elevation 2600 feet. Owners, J. and G. Foutes. Small stringers of high grade ore on the surface. Ore base with depth. Development work consists of several tunnels, 1200 feet of drifts, and a stope; 3-stamp mill and 1500 foot tramway from mine to mill. Worked during the winter. Small producer.

Toughnut, in Sec. 6, T. 37 N., R. 12 W., in the New River mining district, 2 miles north of Denny in the Trinity Reserve. Owner, F. Ladd. Comprises 20 acres, located in 1890; ore shoot 100 feet long and 2 feet wide; diabase foot and quartz-porphyry hanging-walls; 260-foot tunnel. Little high grade ore found. Idle.

Bibl.: Report XIII, p. 464.

Triangle, in Sec. 11, T. 33 N., R. 8 W., in the Deadwood mining district, 1 mile west of Deadwood. Owner, J. Hollingsworth. Comprises 40 acres, at an elevation of 3600 feet. Small vein in slate; 290-foot tunnel, 300 feet of drifts, and 1 stope (40 feet by 3 feet by 60 feet); said to have produced $15,000. Some high grade ore extracted. Idle.

Trinity Bonanza King, formerly known as Bonanza King Consolidated, in Sec. 14, T. 37 N., R. 7 W., in the Trinity Center mining district, 9 miles northeast of Trinity Center, in the Shasta Forest Reserve. Owner, Foster Gold Mining Company, of San Francisco. C. G. Foster, president. Comprises 130 acres, located in 1886. Elevation 6100 feet; extent of ore shoot not determined; formation, slate and quartz-porphyry; 1000-foot tunnel, drifts and stopes (100 feet by 3 feet by 70 feet). Equipment: cars, 3500-foot automatic tramway,

assay office, dwellings, electric plant and 20-stamp mill (electrically driven). Idle. Producer at one time. Some rich ore milled. Four men employed in extending lower tunnel. (See photos Nos. 4 and 5.)

Bibl.: Report XIII, p. 440.

Photo No. 4. Trinity Bonanza King Mine. Interior view, 20-stamp mill.

Photo No. 5. Trinity Bonanza King Mine. Automatic tram.

True Blue, in Sec. 21, T. 37 N., R. 7 W., in the Trinity Center mining district, 1 mile southeast of Carrville, in the Shasta Forest Reserve. Owner, George LaBlanc; comprises 9 acres, located in 1892; elevation 3700 feet; ore shoot 80 feet long and 12 inches wide, free milling; slate foot and diorite hanging-walls; 300-foot tunnel; small pocket taken out in 1911; owner doing assessment work.

True Fissure, in Sec. 15, T. 35 N., R. 10 W., in the Canyon Creek mining district, 2 miles north of Dedrick, in the Trinity Forest Reserve. Owner, Bank of Tehama; comprises 40 acres, patented; ore shoot, 250 feet long and 4 feet wide, between schist and granite walls; 2 tunnels, 460 and 120 feet long on the vein, and 600 feet of drifts, and 1 stope; said to have produced $30,000; being worked by two lessees; strong well-defined ledge on the surface; good prospect.

Uncle Sam, in Secs. 32 and 5, T. 9 and 8 N., R. 8 E., in the New River mining district, ½ mile north of Coeur, in the Trinity Reserve. Owner, J. Cullich; comprises 80 acres; ore shoot, 110 feet long and 10 inches wide, free milling and high grade, between diabase walls; strike of vein, N. 40° W.; dip, vertical; 310-foot tunnel, 200-foot shaft, 2 levels with 600 feet of drifts, raises and stope (80 feet by 3 feet by 120 feet); equipment; two 30 h.p. boilers, dwellings, and old 5-stamp mill driven by steam power; said to have produced $60,000; idle at present.

Bibl.: Report XIII, p. 465.

Venicia, in T. 33 N., R. 9 W., in the Lewiston mining district, about 6 miles northeast of Lewiston. Owners, Roberts, Fisher & Peterson; comprises 60 acres, on Eastman Gulch; ore shoot is 250 feet long and 2 feet wide, free milling, between slate walls; strike, northwest and southeast; dip 10° S.; workings consist of 3 tunnels, from 100 to 750 feet in length, each 100 feet apart, 500 feet of drifts and a stope, 100 feet by 3 feet by 200 feet; greatest depth is 200 feet; equipment consists of cars, dwellings, and 5-stamp Hendy mill (1000-pound stamps) driven by waterpower from Eastman Gulch, through a ditch 1½ miles long; 2 men employed in the mine; the best ore has been worked; claim a production of $500,000; been worked since 1886; custom ore treated in this mill at present.

White Cloud Pocket, in Sec. 5, T. 34 N., R. 8 W., in the Lewiston mining district, 2 miles north of Lewiston. Owner, J. W. Phillips; comprises 40 acres, patented; small vein, in quartz-porphyry; 200-foot tunnel and 250 feet of drifts; worked for pockets; $2500 pocket extracted in 1912; idle at present.

Yellow Astor, in Secs. 29 and 21, T. 35 N., R. 11 W., in the East Fork mining district, 9 miles northeast of East Fork. Owner, East Fork Development and Mining Company, of Boulder Creek, Cal.; W. S.

G. Todd, president and manager; G. H. Aram, secretary; comprises 40 acres, located in 1905; 2 tunnels, 135 and 170 feet, also 45-foot shaft, all in ore; free milling and good grade; walls are dolomite and hornblende schist; fissure vein; some ore blocked out; closed down during the winter.

GOLD PLACERS—HYDRAULIC.

Bald Point, in Sec. 33, T. 33 N., R. 9 W., in the Lewiston mining district, 4 miles southwest of Lewiston. Owner, P. M. Paulsen; comprises 120 acres, patented, on the Trinity River; depth of gravel 20 feet; slate bedrock; water from Grass Valley Creek through a ditch 12 miles long; idle for several years; rich diggings worked in early days.

Bibl.: Report XII, p. 313; XIII, p. 459.

Bartel Jacobs, formerly known as Red Hill, in Secs. 1, 2, 34, 35 and 36, T. 33 and 34 N., R. 11 W., in the Junction City mining district, 1 mile north of Junction City. Owners, H. and J. Jacobs; comprises 390 acres, of which 249 acres are patented; slate bedrock; 30 feet of gravel; water from Connor Creek through a ditch 3 miles long; equipment: 2 giants, 1500 feet of pipe, dwelling; yearly production about $4000; only short season due to litigation over water rights; famous property and said to have a large production record; only 25 acres have been worked, with large area still remaining.

Bates and Van Matre, in Sec. 33, T. 34 N., R. 8 W., in the Lewiston mining district, 4 miles north of Lewiston. Owner, Chinese Company, of San Francisco; comprises 20 acres, patented, on the Trinity River; diorite bedrock; depth of gravel, 20 feet; water from Mooney Gulch through a ditch 2 miles long; equipment, giant, 1000 feet of pipe, dwelling; idle since 1911; has been a good producer.

Bibl.: Report XIII, p. 438.

Beaudry, formerly known as Greenhorn Gulch, in Secs. 28, 29, 20, 32, 33, 5, 6, 7, 8 and 9, T. 35 N., R. 8 W., in the Minersville mining district, 4 miles north of Minersville, in the Trinity Reserve. Owner, L. E. Whipple, of Cleveland, Ohio; E. M. Gleason, watchman; comprises 600 acres, on east fork of Stewart's Fork; diorite bedrock; 20 to 60 feet of gravel; water from east fork of Stewart's Fork through a ditch 5 miles long; capacity, 2550 inches; equipment, 3 giants, 3000 feet of pipe, dwelling; watchman on property; idle since 1910 due to litigation, only assessment work being done; good ground, and good producer at one time.

Big Creek, in Secs. 7 and 8, T. 31 N., R. 11 W., in the Hay Fork mining district, 1 mile east of Hay Fork, in Trinity Reserve. Owner, Big Creek Placer Mining Company, of Oakland, Cal.; A. E. Dawson,

president; J. A. Healewood, superintendent; comprises 58 acres, on Big Creek; slate bedrock; depth of gravel 40 feet; water from Big Creek and Hay Fork River, through 2 ditches, each 2 miles long; capacity, 600 inches; 2 giants, 1500 feet of pipe; dwelling; only worked on a small scale, due to lack of water.

Big East Fork, formerly known as Oswald, in Secs. 30 and 31, T. 35 N., R. 10 W., in the Canyon Creek mining district, 1 mile south of Dedrick. Owner, A. Dannenbrink; comprises 40 acres, patented, on east fork of Canyon Creek; slate bedrock; 20 feet of gravel; equipment: 3 giants, 1800 feet of pipe, dwelling; 2 miles of ditch; 3 men employed at present making repairs; coarse gold; small amount of platinum found; good producer.

Bloss and McClary, in Sec. 5, T. 36 N., R. 7 W., in the Trinity Center mining district, ⅛ mile west of Trinity Center, in the Shasta Reserve. Owner, Sykes Mining Company, of Redding; L. McDonald, president; C. E. McDonald, secretary; comprises 136 acres, patented; elevation 2400 feet; bedrock, slate; depth of gravel 15 to 75 feet; water from Swift Creek through ditch 4½ miles long; capacity 3500 inches; head 300 feet; equipment: 3 giants, 2000 feet of pipe, and sluice boxes; 12 men employed when operating; rich benches; worked since the seventies and a good producer; under option to Alta Bert Dredging Company.

Bibl.: Report X, pp. 699–700; XII, p. 307; XIII, p. 439.

Blue Gravel, in Sec. 1, T. 31 N., R. 11 W., in the Hay Fork mining district, ½ mile east of Hay Fork, in the Trinity Reserve. Owner, D. E. Shack; comprises 40 acres, on Hay Fork Creek; slate bedrock; depth of gravel, 20 feet; water from Hay Fork River through a ditch 1 mile long; equipment: giant, 1000 feet of pipe, dwelling; small producer; idle on account of lack of water.

Blue Lead, in Secs. 6, 31 and 36, T. 33 and 34 N., R. 9 and 10 W., in the Weaverville mining district, 1½ miles north of Weaverville. Owner, T. I. Woodbury; comprises 160 acres; slate bedrock; depth of gravel, 60 feet; water from Garden Gulch through a ditch 1½ miles long; capacity 600 inches; equipment, 1 giant, 800 feet of pipe; idle; good producer at one time.

Bower & Matlock, in T. 31 N., R. 11 W., in the Hay Fork mining district, about 3½ miles southeast of Hay Fork, in the Trinity Forest Reserve. Owners, Bower & Matlock, of Red Bluff, Cal.; comprises 120 acres on east fork of Hay Fork; schist bedrock; depth of gravel, 25 feet; water from east fork of Hay Fork through a ditch 1 mile long; equipment: 2 giants, 1100 feet of pipe, dwelling; 2 men employed making repairs; short season due to lack of water; some good ground; small producer; 40 acres located as quartz claims.

Brown's Bar, formerly known as Hackerman Bar, in T. 7 N., R. 7 W., in the New River mining district, near Denny. Owner, Brackett and James Estate; comprises 140 acres; elevation 1950 feet; diabase bedrock; depth of gravel, 15 feet; water from Longtail Creek; equipment: giant, 900 feet of pipe, sawmill and dwelling; 2 men employed; small water supply, so only a few days' run each winter; gold coarse; worth $18 per ounce.

Burger, in Secs. 12 and 13, T. 34 N., R. 11 W., in the Junction City mining district, ½ mile west of Junction City. Owner, J. A. Burger; comprises 26 acres, of which 11 acres are patented; shale bedrock; depth of gravel, 30 feet; water from Gwin Gulch through Eagle and Empire ditch, 3 miles in length; capacity, 600 inches; head 120 feet; equipment: 1 giant and 1000 feet of pipe; good producer at one time. Idle.

Cacy, in Secs. 26 and 27, T. 32 N., R. 9 W., in the Indian Creek mining district, 5½ miles southeast of Douglas City. Owner, Indian Creek Placer Mining Company, of Weaverville; president and manager, H. M. Hall; comprises 65 acres, patented, on Indian Creek; slate bedrock; depth of gravel, 40 feet; water from Slate Creek through a ditch 1 mile long; idle at present; some good ground worked.

Cement and Mule Creek, formerly known as Mule Creek, in Secs. 30, 31 and 32, T. 35 N., R. 8 W., in the Minersville mining district, 1½ miles north of Minersville in the Trinity Forest Reserve. Owner, J. Skewis; comprises 150 acres, patented, slate bedrock; depth of gravel, 30 feet; water from Mule Creek through a ditch 1 mile long; capacity, 1000 inches; equipment: 2 giants, 1000 feet of pipe, dwelling; idle since 1911; 10 acres worked and over $200,000 produced.

Chapman & Fisher, formerly known as Gribble, in Secs. 18, 19, 29 and 30, T. 33 N., R. 10 W., in the Junction City mining district, 2 miles south of Junction City. Owners, Chapman & Fisher; comprises 213 acres, patented, on Trinity River; bedrock, diorite and slate; depth of gravel, 30 feet; water from Gribble and Oregon gulches, through a ditch 3 miles long; capacity, 600 inches; equipment: 2 giants, 1500 feet of pipe; dwellings; one of the best producers in this district; little platinum found, the amount decreasing last few years; worked during the winter months.

Bibl.: Reports X, p. 708; XIII, p. 442.

Clover, in Sec. 12, T. 37 N., R. 8 W., in the Trinity mining district, 1½ miles northwest of Carrville, in the Shasta Forest Reserve. Owner, A. M. Daly; comprises 106 acres; slate, bedrock; 25 feet of gravel; water from Coffee Creek through ½ mile of flume; 2 giants and 600 feet of pipe; produced about $200,000. Idle.

Corona de Oro, formerly known as the Upton, in the Lower Trinity mining district, in the Trinity Reserve. Nearest town is China Flat. Owner, Corona de Oro Mining Company, of Eureka, Humboldt County, Cal.; W. E. Olmstead, president; W. Taylor, secretary; slate bedrock; said to comprise 400 acres; water from Cedar and Hawkins Bar creeks, through a ditch 3½ miles long; equipment: giant, 300 feet of pipe, dwellings; said to have produced $1600 in eight days; 8 men employed at present, but over 40 at one time, constructing 6 miles of flume and ditch and 1100-foot tunnel, to bring water from Cedar Creek to the mine; good ground.

Curley, in Sec. 1, T. 31 N., R. 11 W., in the Hay Fork mining district, ¾ mile northeast of Hay Fork, in the Trinity Reserve. Owner, W. Leach; comprises 99 acres; slate bedrock; 25 feet of gravel; water from Hay Fork River, through Woodbury ditch 3 miles long, capacity 800 inches; equipment: 2 giants, 1600 feet of pipe, dwelling; only worked on a small scale, due to scarcity of water; small producer; some coarse gold.

Dannenbrink, in Sec. 12, T. 34 N., R. 11 W., in the Junction City mining district, 6 miles north of Junction City. Owner, C. Dannenbrink Estate; W. F. Dannenbrink, superintendent; comprises 39.94 acres; slate bedrock; depth of gravel, 30 feet; water from Gwin's Gulch, through a ditch 1 mile long; capacity 800 inches; equipment: 2 giants, 1000 feet of pipe, dwelling; 2 men employed making repairs, 6 during operating season; pays a dividend; operated from January to June.

Bibl.: Report XIII, p. 444.

Dolly Varden, in Sec. 9, T. 33 N., R. 10 W., in the Junction City mining district, 2 miles west of Junction City. Owners, Schaffer Brothers; comprises 50 acres; shale bedrock, tilted; 12 feet of gravel; water from Ox Canyon and Lime Kiln Gulch, through a ditch 1 mile long; equipment: 1 giant and 1000 feet of pipe, dwelling; operated during the winter; some good ground; producer.

Drinkwater, in Secs. 13 and 24, T. 31 N., R. 12 W., in the Hay Fork mining district, 2 miles south of Hay Fork, in the Trinity Reserve. Owner, Drinkwater Mining Company, of Oakland, Cal.; comprises 100 acres, on Kingsbury Gulch; schist bedrock; depth of gravel, 20 feet; water from Kingsbury Gulch, through 2 ditches each 2 miles long; capacity, 600 inches; equipment: 2 giants, 2000 feet of pipe, dwelling; operated on a small scale during the winter, due to poor water supply; some good gravel; small producer.

Driver, in Sec. 15, T. 33 N., R. 10 W., in the Weaverville mining district, 2 miles southwest of Weaverville. Owner, G. D. Young;

comprises 160 acres; grano-diorite bedrock; gravel 40 feet deep; water from Dutton's Creek, through a ditch 1 mile long; small producer. Idle at present.

East Fork, in Secs. 1, 2, 11 and 12, T. 36 N., R. 7 W., in the Trinity Center mining district, 3½ miles east of Trinity Center, in the Shasta Reserve. Owners, M. MacWaine et al., comprises 520 acres on east fork of Trinity River; bedrock slate; depth of gravel, 15 to 60 feet; water from east fork of Trinity River, through a ditch 3 miles long; capacity, 1000 inches; head, 300 feet; equipment: 3 giants, 2500 feet of pipe; dwelling; 10 men employed when in operation; benches, rich in places; producer.

Eastman, in Secs. 33 and 34, T. 34 N., R. 8 W., in the Lewiston mining district, 4 miles north of Lewiston. Owners, Jim Sing et al. Comprises 114 acres, patented, on Trinity River at mouth of Eastman Gulch; diorite bedrock; depth of gravel, 30 feet; water from Eastman Gulch through a ditch 5 miles long; capacity 1000 inches; equipment, 2 giants, 2000 feet of pipe, derrick and dwelling; 3 Chinese employed; good producer; been worked for years; sold recently to a San Diego company.

Bibl.: Report XIII, p. 451.

Evans Bar, in Sec. 32, T. 33 N., R. 10 W., in the Junction City district, 5 miles south of Junction City. Owners, Carr Brothers. Comprises 70 acres, patented; slate bedrock; depth of gravel 30 feet; equipment, 2 giants, 1500 feet of pipe; good producer at one time. Idle at present.

Bibl.: Report XIII, p. 446.

Garden Gulch, in Secs. 1, 12, and 36, T. 33 and 34 N., R. 10 W., in the Weaverville mining district, 1 mile north of Weaverville. Owners, J. A. Wallace et al. Comprises 107 acres on Weaver Creek; water obtained through a ditch 2 miles long; capacity 1000 inches; equipment, 2 giants, 2500 feet of pipe, dwelling; 4 men employed at present making repairs, and 10 during operating season; dividend payer; some good ground.

Gem, formerly known as the Scharber, in the Lower Trinity mining district, in Trinity Forest Reserve. Owners, Teal and Perigot. Comprises 400 acres, patented, on the Trinity River; nearest town, China Flat; water from Scharber and Quimby creeks; slate bedrock; depth of gravel, 30 feet; equipment, 3 giants, 4000 feet of pipe, buildings, sawmill; 2 reservoirs; 6 men employed when in operation, from December to June; gold worth $18.50 per ounce; black sands carry a little platinum; producer.

Gold Dollar, in Sec. 33, T. 33 N., R. 9 W., in the Lewiston mining district, 4 miles southwest of Lewiston. Owner, Last Chance Mining Company, of Weaverville. Comprises 50 acres, patented, on the Trinity River; slate bedrock; depth of gravel, 20 to 100 feet; some cemented gravel 3 feet thick and boulders; water from Grass Valley Creek through a ditch 10 miles long; capacity, 2500 inches; equipment, 2 giants and 1500 feet of pipe. Idle. Good producer at one time.

Haas, in Secs. 7 and 12, T. 33 N., R. 10 and 11 W., 1 mile west of Junction City, in the Trinity Reserve. Owner, F. G. Haas. Comprises 102 acres on Trinity River; shale bedrock; depth of gravel 10 to 40 feet; water from Black's Gulch through a ditch 1 mile long; equipment, 2 giants, 1500 feet of pipe, dwelling; worked on a small scale; rich gravel taken out at times from old bench.

Bibl.: Reports X, p. 703; XII, p. 311; XIII, p. 448.

Hager & Haas, in Secs. 7 and 18, T. 33 N., R. 10 W., in the Junction City mining district, 1½ miles east of Junction City. Owners, Hager & Haas. Comprises 159 acres, patented, on Trinity River; elevation 1700 feet; shale bedrock; depth of gravel 10 to 30 feet; water from Black's Gulch through ditch 7 miles long; capacity 1800 inches; head 250 feet; equipment, 3 giants, 3500 feet of pipe, dwelling; yearly production from $5000 to $7000; operating cost yearly $2500; some good ground; worked from January to June.

Hang Bar, in Sec. 36, T. 31 N., R. 11 W., in the Hay Fork mining district, 4 miles southeast of Hay Fork, in the Trinity Forest Reserve. Owner, Chinese Company. Comprises 40 acres; schist bedrock; depth of gravel, 20 feet; water from east fork of Hay Fork River through a ditch 4 miles long; capacity 1600 inches; equipment, giant and 2000 feet of pipe; water supply limited; produces about $3000 per year; 3 Chinese employed.

Happy Home, in Sec. 30, T. 35 N., R. 10 W., in the Canyon Creek mining district, ½ mile south of Dedrick. Owner, F. Heurtevant. Comprises 50 acres on east fork of Canyon Creek; elevation 2400 feet; slate bedrock; 15 to 30 feet of gravel; ditch 2 miles long; produced over $400,000 from 25 acres; 3 benches; considerable coarse gold. Idle.

Haskins, formerly known as *Hatchet Creek* and *Shoo Fly,* Trinity Center mining district, ½ mile north of Trinity Center, in the Shasta Reserve. Owner, F. Petra. Comprises 128 acres, of which 53 acres are patented; slate bedrock; depth of gravel 20 to 30 feet; water from Buckeye Creek through a ditch 6 miles long; capacity 500 inches; head 150 feet; equipment, 2 giants and 1000 feet of pipe; good producer at one time. Idle at present, and only assessment work performed last few years.

Bibl.: Report XIII, p. 448–449.

Hawkins Bar, formerly known as *Trinity River Hydraulic Gold Mine,* in Secs. 28 and 29, T. 6 N., R. 6 E., in the lower Trinity mining district, in the Trinity Forest Reserve. Nearest town, China Flat. Owner, J. Smith. Comprises 340 acres, patented; located in the sixties; slate bedrock; depth of gravel 28 to 38 feet; water from Hawkins Bar Creek, through 5 ditches, having a total length of 2½ miles; equipment, giant, 1800 feet of pipe, buildings; idle since 1909; some good ground; gold worth $18.25 an ounce; a little platinum.

Bibl.: Report XIII, p. 449.

Henderson, in Sec. 13, T. 6 N., R. 5 E., 8 miles from China Flat, in the Lower Trinity mining district, in the Trinity Reserve. Owners, Ferguson and Henderson. Comprises 60 acres on Trinity River; located in 1896; slate bedrock; depth of gravel 25 feet; equipment, giant, 800 feet of pipe, 2 buildings; water from west fork of Sharburo Creek; a little platinum with the gold; small producer; bonded in 1912; adjoining mines, Top Notch and Gem.

Hook and Ladder, in Secs. 5 and 6, T. 33 N., R. 9 W., in the Weaverville mining district, 1 mile north of Weaverville. Owners, B. R. Rule et al. Comprises 124 acres; slate bedrock; depth of gravel 35 feet; water from Rush Creek through a ditch 8 miles long; capacity 600 inches; equipment, 1 giant, 1000 feet of pipe, dwelling; 2 men employed repairing ditch; yearly production about $7000 and operating costs about $2200.

Horseshoe and Homestake, formerly known as the Testy, in Sec. 18, T. 33 N., R. 9 W., ½ mile south of Weaverville, has been a good producer of placer gold for a number of years. Owner, Homestake-Ellerbrook Consolidated Mining Company, of Weaverville; W. B. Testy, president; A. J. Testy, secretary and superintendent. Comprises 170 acres; slate bedrock; depth of gravel 30 feet; use surplus water from La Grange ditch, and water from Cooper, Watson, Kenkaid and Gold Run gulches; 1 mile of ditch; capacity 300 inches; equipment, giants and 1000 feet of pipe; worked during the winter; producer.

Hydraulic Hill, in Sec. 29, T. 34 N., R. 11 W., in the North Fork mining district, in the Trinity Reserve. Owners, Lorenz Brothers. Comprises 35 acres; slate bedrock; depth of gravel 45 feet; water from Logan's Gulch through 1 mile of ditch; good producer at one time; coarse gold; only 5 acres worked. Idle.

Indian Creek and Panwocket, in Secs. 23, 26, 27 and 28, T. 32 N., R. 9 W., in the Indian Creek mining district, 4 miles southeast of Douglas City. Owner, Dr. D. B. Fields. Comprises 1667 acres, 345 acres being patented; sandstone bedrock; depth of gravel 30 to 50 feet; idle, as no water on claims, as old ditch from Indian Creek has been destroyed; some good ground.

Ingleside, in Secs. 27 and 28, T. 35 N., R. 8 W., in the Minersville mining district, 2 miles north of Minersville, in the Trinity Reserve. Owner, G. A. Seward. Comprises 60 acres; water from east fork of Stewart's Fork through a ditch 6 miles long; capacity 700 inches; elevation 2300 feet; diorite bedrock; depth of gravel 30 feet; equipment, 2 giants, 700 feet of pipe, dwelling; producer at one time; only assessment work performed.

Jacob, in Secs. 34 and 35, T. 34 N., R. 11 W., in the Junction City mining district, 2 miles north of Junction City. Owner, H. Jacob. Comprises 71 acres, patented; shale, bedrock; depth of gravel 15 to 40 feet; water from Connor Creek through a ditch 3 miles long; equipment, giant, 1000 feet of pipe, dwelling; worked on small scale; some good gravel; not sufficient water for a season's run.

Bibl.: Report X, p. 707; XIII, p. 450.

Joss, in Secs. 18 and 7, T. 33 N., R. 9 W., in the Weaverville mining district, 2 miles southeast of Weaverville. Owner, W. S. Lowden. Comprises 139 acres; slate bedrock; depth of gravel, 40 feet; water from Rush Creek through a ditch 12 miles long; equipment, giant and 1000 feet of pipe; idle; some good ground; has been a producer.

King, formerly known as *King and Bayles,* in the Trinity Reserve, on Rattlesnake Creek. Owners, King et al., of Helena. Slate bedrock; water from Rattlesnake Creek; 15 feet of gravel; 1 giant and pipe. Three men employed during operating season, lasting about four months. Coarse gold.

La Grange, formerly known as the *Ward and Trinity,* is the largest hydraulic mine in the world in active operation. It is located in Secs. 1, 12, 36, 9, 32, 6, 7, 2, 3, 11, 31, 10, 28, 29, 33, 20 and 13, T. 33 and 34 N., R. 9 and 10 W., in the Weaverville mining district, 2½ miles west of Weaverville, the county seat. It is owned by the La Grange Hydraulic Mining Company, a French syndicate. P. Bouery, manager; C. Jansen, foreman. Comprises 3,000 acres, 1200 being patented. Elevation 2200 to 3500 feet. Bedrock is slate, tilted and soft in spots; gravel bank in places is 500 feet high; loose, with some boulders; water is obtained from Stewart's Fork and Rush Creek, through 27 miles of ditches and flumes; capacity, 12000 inches; head 400 feet. Equipment very complete, consisting of several giants, pipe, sluice-boxes, electrical plant, ice plant, sawmill, shops, dwellings, and 32 miles of telephone line; sluice-boxes are 3000 feet long, 5 feet wide and 4 feet deep; iron rails, set 4 inches apart, are used for riffles; handle 1100 cubic yards of gravel per hour. Thirty men are employed all year around; more men employed when in operation, the season lasting ten months. Some of

the giants are not moved for several months, due to size of the banks. Good dividend payer.

Bibl.: Report VIII, p. 638; X, p. 702; XII, p. 311; XIII, p. 452; U. S. G. S. Bulls. No. 430, pp. 51–56; No. 470, pp. 16–18; No. 540, p. 19.

Larsen, formerly known as *Mason Bar and China Creek,* in New River mining district, near Quimby, in the Trinity Reserve. Owners, Larsen Brothers. Comprises 40 acres; bedrock granite; depth of gravel 10 to 30 feet; water from China Creek. Equipment: giant, 800 feet of pipe, dwelling. Four men employed. Operated during the winter. Produced about $10,000 to date; gold is coarse and worth $18 per ounce. Small producer.

Little Joe, in Sec. 25, T. 32 N., R. 9 W., in the Indian Creek mining district, 6 miles southeast of Douglas City. Owners, Rogers Brothers. Comprises 40 acres. Slate bedrock; depth of gravel 5 to 20 feet; water from Indian Creek, through a ditch 2½ miles long; 1 giant and 1000 feet of pipe, dwelling. Producer at one time. Idle.

Log Cabin Bar, in T. 7 N., R. 7 E., in the New River mining district, in the Trinity Reserve. Owner, F. Staley. Quimby nearest town. Comprises 40 acres, located in 1904. Granodiorite bedrock; depth of gravel, 40 feet; water from Log Cabin Gulch; 1 giant, 400 feet of pipe, dwelling. Fine gold, worth $17.50 per ounce; a little platinum. Small producer. Limited water supply, hence a short operating season.

Long Gulch, in Sec. 17, T. 35 N., R. 8 W., in the Minersville mining district, 2 miles northeast of Minersville, in the Trinity Forest Reserve. Owner, F. Beaudry Estate. Comprises 120 acres, patented. Slate bedrock; depth of gravel, 50 feet. Equipment: 3 giants, 1000 feet of pipe, dwelling. Idle. Rich ground worked in early days.

Lower Buckeye, in Secs. 19, 30 and 29, T. 37 N., R. 7 W., in the Trinity mining district, 2 miles north of Trinity Center, in the Shasta Reserve. Owner, Trinity Gold Mining Company, of Ohio; E. A. Ellston, president. Comprises 140 acres on Buckeye Creek. Slate bedrock; 30 feet of gravel; water from Buckeye Creek through a ditch 2 miles long; capacity 300 inches; head 140 feet. Equipment: 2 giants and 800 feet of pipe. Some good gravel. Idle since 1911.

Lower Dutton's Creek, in Secs. 26 and 35, T. 33 N., R. 10 W., in the Indian Creek mining district, 3 miles north of Douglas City. Owners, Lorenz Brothers. Comprises 785 acres. Slate bedrock; depth of gravel, 50 feet; water from Dutton's Creek through a ditch 2 miles long. Equipment: 2 giants, 1500 feet of pipe, dwelling. Two men employed making repairs; 6 men used during operating season. Good producer; said to have produced at least $300,000 to date.

Lucky Strike and Effie Belle, in Sec. 24, T. 33 N., R. 10 W., in the Weaverville mining district, 4 miles southeast of Weaverville. Owner, J. Armentrout. Comprises 80 acres. Slate bedrock; depth of gravel, 30 feet; water from Democrat Gulch, through a ditch 1 mile long. Equipment: giant and 800 feet of pipe. Coarse gold found. Idle last two years.

McAtee Bar, in T. 7 N., R. 7 E., in the New River mining district, in the Trinity Reserve. Owner, C. S. McAtee. Comprises 60 acres, one location, the Kuntz, being made in 1853. Nearest town, Quimby. Granite bedrock; 15 feet of gravel. Equipment: 1 giant, 400 feet of pipe, 2 small reservoirs, dwelling. One man employed; working season lasts forty days. Fine gold worth $17.75 per ounce. Small producer.

Maple Creek, in Secs. 4, 5, 6, 8, 29, 30, 32 and 33, T. 32 N., R. 10 W., in the Junction City mining district, 4 miles south of Junction City. Owner, Maple Creek Mining Company, of San Francisco; F. L. Keller, superintendent. Comprises 1594 acres, of which 198 acres are patented. Bedrock, slate and diorite; depth of gravel, 25 feet; water from Dutch Creek, through a ditch 3 miles long. Equipment, 3 giants, 2000 feet of pipe, dwellings. Four men employed. Producer. Operated during the winter.

Meckel, in Secs. 13 and 14, T. 33 N., R. 10 W., in the Weaverville mining district, 1 mile southeast of Weaverville. Owners, Meckel Brothers; comprises 180 acres; diorite bedrock; depth of gravel, 20 to 100 feet; water from Democrat Gulch, through a ditch 2 miles long; capacity, 300 inches; equipment: 3 giants, 1500 feet of pipe, dwelling; 2 men employed making repairs, and 8 men during operating season; good producer; some coarse gold.

Miller, in Sec. 33, T. 34 N., R. 11 W., in the North Fork mining district, ½ miles south of North Fork. Owner, C. Miller; comprises 40 acres; equipment: 2 giants, 1000 feet of pipe, dwelling; some coarse gold; yearly production about $2000. Idle in 1912.

Monk, in Sec. 5, T. 32 N., R. 9 W., in the Indian Creek mining district, 1 mile east of Douglas City. Owner, W. Brannan; comprises 30 acres on Indian Creek; slate bedrock; depth of gravel, 5 to 20 feet; equipment: 2 giants, 1000 feet of pipe, dwelling; producer at one time; idle at present.

Morrison Gulch, in Secs. 12 and 13, T. 37 N., R. 8 W., in the Trinity Center mining district, 2 miles northwest of Carrville, in the Shasta Reserve. Owner, C. Hilton; comprises 76 acres, patented, on Coffee Creek; slate bedrock; 25 to 30 feet of gravel; water from Little Boulder Creek, through 1½ miles of ditch; equipment: 2 giants, 1500 feet of pipe, dwelling; 8 men employed during the season; good producer.

Montezuma, in Secs. 1, 2, 11 and 12, T. 33 N., R. 11 W., in the Junction City mining district, 1 mile north of Junction City. Owner, T. F. Bergin; comprises 77 acres, patented; slate bedrock; depth of gravel, 30 to 40 feet; producer at one time, but ground can not be worked any more on account of lack of water; area worked, 10 acres.

Nash, in Secs. 6, 7, 8, 28, 29, 30 and 31, T. 37 and 38, R. 9 W., in the Trinity Center mining district, 12 miles northwest of Carrville, in the Shasta Reserve. Owners, Trinity Hydraulic Gold Mining Company, Ltd., of London, England; G. Abrams, superintendent; comprises 474 acres, patented, on Coffee Creek; slate bedrock; 15 to 30 feet of gravel; water from Coffee Creek, through 3-mile ditch; capacity, 3000 inches; head 200 feet; equipment: hydraulic elevators, 5 giants, 2500 feet of pipe, dwellings, derrick; 8 men employed at present and 15 during the operating season; good producer; company also owns the "Abram & Blythe" placer properties, which are not worked.

Bibl.: Report XIII, pp. 464–465.

New River Placer, in Sec. 13, T. 6 N., R. 5 E., in the New River mining district, in the Trinity Forest Reserve. Owner, New River Mining Company, of Bakersfield, Cal.; nearest town, Quimby; elevation, 1650 feet; comprises 130 acres on Quimby Creek; granitic-porphyry bedrock; depth of gravel 22 feet; equipment: 2 giants, 600 feet of pipe, sawmill and 5 buildings; 12 men employed when in operation; coarse gold, worth $18.35 per ounce; a little platinum; season lasts 8 months; total operating costs 7 cents per yard; "high-line" ditch; producer.

Nigger Hill, in Sec. 2, T. 32 N., R. 10 W., in the Indian Creek mining district; 1½ miles northwest of Douglas City. Owner, G. Lewman; comprises 40 acres; elevation, 1700 feet; diorite bedrock; 30 feet of gravel; water from Dutton's Creek, through a ditch 3 miles long; capacity, 500 inches; equipment: 2 giants, 1000 feet of pipe, dwelling; 2 men employed, and 6 during operating season; producer.

O'Connell, in Sec. 33, T. 32 N., R. 9 W., in the Indian Creek mining district; 5 miles southeast of Douglas City. Owner, William Wallace; comprises 80 acres on Reading's Creek; slate bedrock; depth of graven, 5 to 20 feet; water from Reading's Creek, through a ditch ¾ mile long; capacity, 500 inches; equipment: 2 giants, 800 feet of pipe, dwelling; 2 men employed, making repairs; when in operation, 6 to 8 men employed; producer.

Potilla, in Sec. 11, T. 33 N., R. 10 W., in the Weaverville mining district, 1 mile west of Weaverville. Owner, F. Potilla; comprises 30 acres, on Grub Gulch; slate bedrock; depth of gravel, 20 feet; water from Grub Gulch, through a ditch 1½ miles long; equipment: giant and 800 feet of pipe; small producer; best values on bedrock.

Post & Wilson, formerly known as *Good Friday,* in Secs. 19 and 20, T. 33 N., R. 11 W., in the Junction City mining district, 2 miles south of Junction City. Owners, Post & Wilson; comprises 160 acres on Trinity River; slate bedrock; 25 to 50 feet of gravel; equipment: 2 giants and 1500 feet of pipe; some good ground; worked during winter; producer.

Potter & Humboldt, in Secs. 1, 6, 2, 5, 7 and 12, T. 34 N., R. 8 and 9 W., in the Minersville mining district, 2 miles southwest of Minersville, in the Trinity Forest Reserve. Owner, Humboldt Placer Mining Company, of Blocksburg, Humboldt County; W. Stowers, superintendent; comprises 1270 acres on Stewart's Fork; slate bedrock; depth of gravel, 20 to 60 feet; water from Stewart's Fork, through a ditch 1 mile long; capacity, 2000 inches; equipment; 3 giants, 2000 feet of pipe, dwelling; 2 men employed; good ground; producer; worked during the winter.

Poverty Flat, in Secs. 18 and 19, T. 33 N., R. 9 W., in the Weaverville mining district, 3½ miles southeast of Weaverville. Owners, Lorenz Brothers. Comprises 30 acres, patented; diorite bedrock; 20 to 30 feet of gravel; equipment: two giants. 1000 feet of pipe, dwelling; water from Brown's Creek through a ditch 6 miles long; capacity, 600 inches; operated during the winter; producer.

Quimby, in Sec. 18, T. 6 N., R. 6 E., in the Lower Trinity mining district, in the Trinity Reserve. Owners, Ferguson and Ziegler; nearest town, China Flat; comprises 100 acres, located in the early fifties; slate bedrock; depth of gravel, 25 feet; some cemented; scale—gold worth $18.50 per ounce; a little platinum; under option to Perigot and is to be drilled for dredging.

Bibl.: Report XIII, p. 460.

Railroad and Mt. Morensis, in Secs. 9, 15 and 16, T. 33 N., R. 10 W., in the Junction City mining district, 2 miles southwest of Junction City. Owners. Schaffer Brothers. Comprises 307 acres, patented, on the Trinity River; slate bedrock; depth of gravel. 30 feet; 2 giants, 600 feet of pipe: producer at one time; idle since 1910.

Red Flat, in Sec. 12, T. 34 N., R. 11 W., in the Canyon Creek mining district. 4 miles south of Dedrick, in the Trinity Reserve. Owner. Dannenbrink Estate. Comprises 55 acres, patented; slate bedrock 25 feet of gravel; water from Gwin Gulch through 2-mile ditch; capacity 1500 inches; head. 150 feet; equipment: 2 giants, 1500 feet of pipe. dwelling; yearly production from $6000 to $10.000; total operating cost $2500; idle at present.

Roe, in Secs. 1, 6 and 31, T. 32 and 33 N., R. 9 and 10 W., in the Indian Creek mining district, 1 mile east of Douglas City. Owner, C. E. Thayer. Comprises 36 acres, patented; slate bedrock; depth of

gravel, 25 feet; water from Weaver Creek through a ditch 5 miles long; capacity 600 inches; has been a good producer; idle.

Schloner, formerly known as the Rittubush, in Sec. 28, T. 33 N., R. 11 W., in the North Fork mining district, in the Trinity Reserve. Owners, H. C. Schloner et al.; comprises 88 acres, located in the fifties; depth of gravel, 10 to 40 feet; slate bedrock; old bench; water from North Fork Gulch; best pay gravel last 3 feet above bedrock; equipment: 2 giants, 1200 feet of pipe, sluice-boxes and dwellings; 2 men employed; yearly production, $1500 to $3000; gold worth $18 per ounce; some platinum; worked during the winter season.

Senger, in Secs. 12 and 13, T. 33 N., R. 10 W., in the Weaverville mining district; ¼ mile south of Weaverville. Owner, J. Senger. Comprises 60 acres; grano-diorite bedrock; depth of gravel, 20 feet; water from West Weaver Creek through a ditch ½ mile long; equipment: giant and 1000 feet of pipe; good producer at one time; worked on a small scale during the winter.

Sheridan, in Secs. 18 and 19, T. 33 N., R. 10 W., in the Junction City mining district, 1 mile south of Junction City. Owner, W. J. Dyman. Comprises 104 acres, patented; shale bedrock; depth of gravel, 25 feet; water from Simpson's Gulch through a ditch 1 mile long; head, 200 feet; capacity, 750 inches; equipment: 2 giants, 1600 feet of pipe, dwelling; 2 men employed and 6 when in operation; production yearly about $5000; profit $3000; worked from January to May.

Bibl.: Reports XII, p. 313; XIII, p. 462.

Slate Creek, in Secs. 2 and 3, T. 34 N., R. 9 W., in the Minersville mining district, 3 miles southwest of Minersville, in the Trinity Reserve. Owner, F. Cadematori. Comprises 120 acres on Slate Creek; slate bedrock; depth of gravel, 40 feet; water from Slate Creek through a ditch 1 mile long; capacity, 500 inches; equipment: giant, 500 feet of pipe, dwelling; idle; only do assessment work.

South Fork, in Secs. 22, 23, 14 and 15, T. 6 N., R. 5 E., in the Lower Trinity mining district, in the Trinity Reserve; nearest town, China Flat, Humboldt County. Owner, South Fork Gold and Platinum Mining Company; P. P. Hammer, president; J. Kahlker, secretary. Comprises 885 acres on Trinity River; equipment: giant, 600 feet of pipe, dwelling; 1 man employed; fine gold, and black sands carry a little platinum; property involved in litigation; depend on rains for water supply; small producer.

Sowden, in Sec. 2, T. 33 N., R. 10 W., in the Weaverville mining district, 1¾ miles northwest of Weaverville. Owners, Ah Fong et al. Comprises 40 acres on Weaver Creek; slate bedrock; depth of gravel, 40 feet; water from West Weaver Creek through a ditch 1 mile long;

equipment: giant and 1000 feet of pipe; 2 Chinese employed; small producer.

Steiner's Flat, formerly known as Hurst and Eliason, in Secs. 35 and 36, T. 33 N., R. 10 W., in the Indian Creek mining district, 2 miles north of Douglas City. Owner, J. H. Lorenz. Comprises 180 acres, patented; slate bedrock; depth of gravel, 30 feet; water from Dutton's Creek, through a ditch 2 miles long; capacity, 600 inches; equipment: 2 giants, 1500 feet of pipe, dwelling; 3 men employed and 8 during operating season; production yearly from $4000 to $10,000; some good ground; old producer; gold worth $17.50 per ounce.

Sturdivant, in Secs. 7 and 8, T. 33 N., R. 10 W., in the Junction City mining district, 1½ miles east of Junction City. Owner, Trinity Gold Mining Company, of San Francisco; comprises 55 acres, patented, along the Trinity River; shale bedrock; depth of gravel, 15 to 35 feet; some coarse gold found; idle.

Ten Cent Gulch, in Secs. 6 and 31, T. 33 and 34 N., R. 9 W., in the Weaverville mining district, 2 miles northeast of Weaverville. Owner, M. L. Woodbury. Comprises 69 acres, patented, at an elevation of 2400 feet; slate bedrock; depth of gravel, 20 feet; water from East Weaver Creek through a ditch 2 miles long; equipment: 1 giant, 1000 feet of pipe, dwelling; leased to Chinese company; Sing Lee, manager; 2 Chinese employed; small producer; about 10 acres has been worked; some good ground.

Tener, in Sec. 30, T. 8 N., R. 8 E., in the New River mining district, in the Trinity Reserve. Owners, W. L. and R. W. Tener. Comprises 240 acres; slate bedrock; depth of gravel, 25 feet; water from Slide and Emigrant Creeks, through flume 1½ miles long and 1000 feet of ditch; equipment: 2 giants, 1600 feet of pipe, sawmill, buildings, derrick; 25 men employed installing equipment; 6 prospect shafts have been sunk to bedrock and good pay found; new location; going to work bottom of Slide Creek.

Texas Bar, in Sec. 6, T. 32 N., R. 9 W., in the Indian Creek mining district, ½ mile north of Douglas City. Owner, G. Vitzthum. Comprises 50 acres; slate bedrock; depth of gravel, 5 to 20 feet; water from Indian Creek through a ditch 3 miles long; equipment: 3 giants, 1500 feet of pipe, dwelling; 2 men employed making repairs, and 8 men during operating season; good producer.

Tolly Hill, in Sec. 34, T. 35 N., R. 9 W., in the Minersville mining district, 3 miles west of Minersville, in the Trinity Reserve. Owner, J. H. Cummings. Comprises 160 acres, on Bear Gulch; slate bedrock; depth of gravel, 50 feet; water from Bear Gulch through a ditch 1½ miles long; capacity 40 inches; equipment—giant and 700 feet of pipe; idle; producer at one time.

Top Notch, in Secs. 12 and 13, T. 6 N., R. 5 E., in the Lower Trinity mining district, 8 miles from China Flat, in the Trinity Reserve. Owners, Ranny and Holliday. Comprises 160 acres, located in 1905; slate bedrock; depth of gravel, 30 feet; water from west branch of Sharber's Creek through a ditch 1 mile long; capacity 500 inches; equipment—giant, 800 feet of pipe, dwelling; fine gold, valued at $18.57 per ounce; 1 ounce of platinum to 6 of gold; use the outfit owned by the Henderson mine; worked during the winter; small producer; adjoins the Henderson, Gem, and Negunda.

Trinity Consolidated Hydraulic, in Secs. 1, 3, 7, 18, 8, 31, 6, 14, 32, 33, 2, 35 and 36, T. 33 N., R. 8, 9 and 10 W., in both Weaverville and Indian Creek mining districts, near the towns of Weaverville and Douglas City. Owner, Trinity Consolidated Hydraulic Mining Company, an eastern corporation; general manager, D. W. Shanks, of Weaverville; J. Murphy, superintendent; comprises 2420 acres, of which 700 are patented; slate and diorite bedrock; length along channel, 3 miles; depth of gravel, 50 to 400 feet; water from east Weaver Creek, through the old Cooper and Watson Ditch; also from east fork of Weaver Creek, through Sloan ditch; also from Grider Gulch; total length of ditches, 22 miles, capacity, 5000 inches; equipment: giants, several thousand feet of pipe, 1000 feet of 22-inch siphon and 500-feet suspension bridge, dwellings; 15 men employed at present; 40 men during the operating season; ranks next to the La Grange as a hydraulic mine; consolidation of several famous properties such as the Union Hill, McMurray and Hupp, Red Point, Bartolet, Douglas City, Ford & Foley and Harvey; good producer; several millions produced from these old holdings.

Bibl.: U. S. G. S. Bulls. No. 430, pp. 51–56; No. 470, pp. 16–18; No. 540, pp. 18–19.

Trinity River Mining Company, in Secs. 5 and 8, T. 33 N., R. 8 W., in the Lewiston mining district, 1½ miles north of Lewiston. Owner, Trinity River Mining Company, of Oakland; Charles Heyer, president; W. R. Thomas, secretary; under lease to Horseshoe Placer Mining Company; W. E. Procter, superintendent; comprises 600 acres, of which 103 acres are patented, on Trinity River; diorite bedrock; depth of gravel, 30 to 40 feet; waterpower obtained from Trinity, through a tunnel 1400 feet long, 12 feet wide and 10 feet high; equipment: Hendy 24-inch pump, turbine water wheel (1000 h.p.), rope transmission, 2200 feet of pipe, dwellings; water pumped from tunnel into elevated sluiceboxes; 12 men employed; rich diggings on the blue channel in early days; leasing company constructing concrete dam, 340 feet long, 3 feet on bottom, 6 feet on top, and 18 feet deep, to divert all of the water in the Trinity River through the tunnel, so as to

work the bed of this stream; holding company began work in 1905 and spent $142,000; tunnel cost $54,000 (all hand work); no production as yet; some good ground, going better than $20 per cubic yard, has been worked on the "blue lead," a noted pay channel.

Bibl.: U. S. Geol. Sur. Bull. No. 540, p. 20.

Valdor, formerly known as Huertevant, in Secs. 1, 2, 26, 27, 34, 35 and 36, T. 33 and 34 N., R. 11 W., in the Junction City mining district, 1½ miles north of Junction City. Owner, M. Huertevant; comprises 845 acres, of which 786 acres are patented; schist bedrock; depth of gravel, 30 feet; water from Conner and Cannon creeks, through 2 ditches, one 3 miles long and the other 7 miles; equipment: 2 giants, 150 feet of pipe, dwellings; being prospected for dredging possibilities by W. Johnson; 5 men employed; land under bond to McCray et al.; said to be good dredging ground; producer.

William Morris, in Sec. 25, T. 32 N., R. 9 W., in the Indian Creek mining district, 5¾ miles southeast of Douglas City. Owners, William Morris et al.; comprises 80 acres, patented; slate bedrock; 5 to 20 feet of gravel; water from Kline Creek, through ditch ½ mile long; capacity, 200 inches; equipment: giant and 800 feet of pipe; water supply limited; small producer.

Woodbury, formerly known as MacParlane, in Sec. 35, T. 31 N., R. 11 W., in the Hay Fork mining district, 3 miles southeast of Hay Fork, in the Trinity Reserve. Owner, Chinese Company, of Hay Fork; comprises 40 acres; schist bedrock; depth of gravel, 20 feet; water from Hay Fork Gulch through a ditch 4½ miles long; capacity, 1200 inches; equipment: 2 giants and 1000 feet of pipe; worked on a small scale; poor water supply; good ground; small producer.

GOLD PLACERS—GROUND SLUICING.

Blue Jib, in Sec. 13, T. 37 N., R. 8 W., in the Trinity Center mining district, 1½ miles northwest of Carrville, in the Shasta Forest Reserve. Owners, Graves & Carter; comprises 20 acres on Coffee Creek; slate bedrock; depth of gravel, 20 feet; water from Coffee Creek, through a ditch ½ mile long; small reservoir; small producer; some good ground; worked during the winter.

Boyd, in Sec. 28, T. 8 N., R. 8 E., in the New River mining district, 1 mile south of Denny, in the Trinity Reserve. Owner, A. Boyd; comprises 20 acres, on Emigrant Creek; schist bedrock; depth of gravel, 10 feet; water from Emigrant Creek, through a ditch ½ mile long; equipment: 500 feet of pipe and dwelling; small producer; coarse gold

Haunted Bar, on Eagle and Slide creeks, in New River mining district, in Trinity Reserve. Owner, J. L. Mushick; comprises 100 acres; 900 feet of ditch and dwelling; coarse gold; a little platinum; worked nine months of the year; small producer.

Lucky Strike, on east fork of New River, about 2½ miles above the mouth of Pony Creek, in the New River mining district, in the Trinity Reserve. Owner, C. Schwelder; comprises 60 acres; schist bedrock; 15 feet of gravel; ½-mile ditch; small producer.

Negunda, in Sec. 12, T. 6 N., R. 5 E., in the Lower Trinity mining district; post office, Burnt Ranch. Owner, H. Zeigler; works bed of slough; small producer.

Stribbling, in North Fork mining district, on Grizzly Creek. Owner, P. T. Stribbling; comprises 40 acres; grano-diorite bedrock; coarse gold; small producer.

GOLD PLACERS—DRIFT.

Buckeye, in Sec. 19, T. 37 N., R. 7 W., in the Trinity Center mining district, 3 miles northwest of Trinity Center, in the Shasta Reserve. Owner, J. Larson; comprises 40 acres, on Buckeye Creek; slate bedrock; depth of gravel 50 feet; tunnel 60 feet long, 4 feet by 7 feet; worked on small scale; good ground.

Ellston, formerly known as Self-Shooter, in Sec. 7, T. 36 N., R. 12 W., in the New River mining district, 2 miles south of Denny, in the Trinity Reserve. Owner, R. Ellston; comprises 20 acres on Emigrant Creek, slate bedrock; depth of gravel, 20 to 60 feet; tunnel, 50 feet long, 5 feet by 7 feet; some coarse gold found; small producer.

Graves, in Secs. 29 and 30, T. 37 N., R. 7 W., in the Trinity Center mining district, 3 miles north of Trinity Center, in the Shasta Reserve. Owner, Trinity Exploration Company, of Carrville; D. Goodale, superintendent and manager; comprises 350 acres, patented, along the Trinity River; old tunnels and shafts; bedrock 20 to 60 feet deep; some rich ground; under option to Wilsie & Hammond; being prospected by drilling for dredging.

Hidden Treasure, in Lower Trinity mining district, on west side of Trinity River. Owner, J. B. McDonald; comprises 60 acres, located in 1903; bedrock is slate; depth of gravel, 40 feet; running tunnel, present length being 65 feet; size 4 feet by 7 feet; not on bedrock; prospecting his ground; some good gravel.

Rainbow, in Sec. 33, T. 38 N., R. 8 W., in the Trinity Center mining district, 6 miles northwest of Carrville, in the Shasta Reserve. Owner, Rainbow Mining Company, of Carrville, A. Patton, president; slate bedrock; 20 to 50 feet of gravel; comprises 60 acres on Coffee

Creek; tunnel, 120 feet long, 6½ by 3½ feet and old shafts, 40 to 50 feet deep; some rich ground worked; small producer.

Bibl.: Report XIII, p. 460.

Sam Hampton, in Secs. 16 and 17, T. 35 N., R. 8 W., in the Minersville mining district, 4 miles north of Minersville, in the Trinity Reserve. Owner, C. E. Wright; comprises 80 acres, on east fork of Stewart's Fork; slate bedrock; depth of gravel, 30 to 50 feet; tunnel 80 feet long, 4 feet by 6 feet; water from east fork of Stewart's Fork through a ditch ¾ mile long; idle; worked during the winter; owner trying to find another pay channel.

Snow Gulch, in Sec. 20, T. 37 N., R. 7 W., in the Trinity Center mining district; 3 miles north of Trinity Center, in the Shasta Reserve. Owner, G. Abrams; comprises 35 acres on Snow Gulch; tunnel, 60 feet long, 4 feet by 6 feet, another 40 feet, and 4 feet by 6 feet; old shaft 40 feet deep; good producer.

Wilker, in Sec. 5, T. 39 N., R. 7 W., in the Trinity Center mining district, ¾ mile north of Trinity Center, in the Shasta Reserve. Owner, J. E. Crawford; comprises 160 acres on Hatchet Creek; schist bedrock; depth of gravel, 10 to 45 feet; tunnel 80 feet long, 3½ feet by 6½ feet; equipment: car, 500 feet of pipe, dwelling; water from Hatchet Creek through a ditch 1 mile long; some coarse gold; small producer.

GOLD DREDGING.

The known dredging fields in Trinity County are located along the Trinity River, near the towns of Trinity Center, Lewiston, and Junction City, and consists of several thousand acres. Two dredges are in operation at the present time, one at Trinity Center, and the other at Lewiston. The ground near Junction City has been drilled and the installing of a dredge is contemplated.

Bibl.: Bull. No. 36, pp. 102–104; No. 57, p. 11; U. S. G. S. Bull. No. 540, p. 19.

Alta Bert, in Secs. 8, 9, 4, 5, 32, 33 and 29, T. 36 and 37 N., R. 7 W., in the Trinity Center mining district, in town of Trinity Center, in the Shasta Reserve. Owner, Alta Bert Dredging Company, of San Francisco; H. Peake, president; W. W. Johnson, secretary; W. H. Christie, vice-president and manager; M. Ashley, superintendent. Comprises 2000 acres, patented, along the Trinity River. Slate and granodiorite; depth of gravel, 15 to 40 feet; loose and easily worked; gravel channel in places over ½ mile wide. Dredge is of the Oroville type with 5½-foot bucket, operated by electricity from Trinity Power Company; sawmill, capacity 15,000 feet per day; shops, office and several dwellings. Eighteen men employed. Company has acquired large

number of old placer claims; also have an option on the Bloss & McClary hydraulic mine. Alta Bert is said to exceed the LaGrange hydraulic mine in production. Some very rich gravel. (See photo No. 6.)

Bibl.: Bull. No. 36, p. 104; U. S. G. S. Bull. No. 540, p. 19.

Photo No. 6. Dredge of Alta Bert Dredging Company.

Trinity Gold Dredge Company, formerly known as *Blakemore and Rocky Bar,* in the Lewiston mining district, in Secs. 32, 33 and 28, T. 34 N., R. 8 W., 4 miles north of Lewiston. Owners, Trinity Gold Dredge Company of Chico; H. E. Chesboro, president; manager, E. L. Smith; superintendent, H. Harris. Comprises 900 acres, patented, along the Trinity River. Slate bedrock; depth of gravel, 40 feet; loose and easily worked; dredge of Oroville type built by New York Engineering Company, with 11-foot bucket, and no stacker but run tailings on a 200-foot sluice-way floated on a barge, with iron rails for riffles, and no plates used; shops; 1500 h.p. electrical plant, with 5 miles of power line; dwellings; 15 men employed; pays dividends; been in operation since 1911.

Bibl.: Bull. No. 36, p. 104; U. S. G. S. Bull. No. 540, p. 20.

GRANITE.

The granite in Trinity County is principally a hornblende granite, and where not decomposed generally shows the effect of strong pressure. These fracture planes and the quartz seams cutting through the rock render much of it unfit for commercial use.

In the Rush Creek quarry, formerly worked by Masterson & Armstrong, of Redding, the hard boulders found in the soft mass of weath-

ered granite were used for ornamental and monumental purposes. This deposit is in Sec. 26, T. 34 N., R. 9 W., M. D. M., on Rush Creek, 6 miles east of Weaverville, the county seat.

Bibl.: Report XII, p. 387; Bull. No. 38, p. 57.

IRON.

Iron ore deposits are reported in several localities in the county, but none of the merit have as yet been developed. In Secs. 4, 5, 9 and 10, T. 30 N., R. 10 W., M. D. M., on the northwest side of Chauchelulla Peak, stringers of iron ore are found lying in contact with large bodies of hypersthene, and the superficial resemblance of the latter material to iron ore may have caused the claim of large outcrops of iron ore in that vicinity.

Bibl.: Bull. No. 38, p. 305.

LIMESTONE.

Limestone is found in many places in this county, a belt of Devonian limestone, associated with igneous rocks, is found running parallel with the South Fork of the Trinity River from its source to Hoopa Valley; also a parallel belt of Devonian limestone running to the northeast of the preceding and another belt of Carboniferous limestone entering Trinity from the southeast in T. 29 N., R. 10 W., running northwest along Hay Fork River, disappearing north of Hay Fork and showing farther north on New River.

Bibl.: Bull. No. 38, p. 94; Diller-American Journal of Science, 4th Series, Vol. 15, p. 342.

On Brown's Mountain, in Sec. 21, T. 33 N., R. 9 W., M. D. M., a belt of limestone was quarried several years ago and burned in a lime-kiln, and the product used in the masonry of the courthouse at Weaverville. It is owned by the Southern Pacific Railroad Company.

Bibl.: Bull. No. 38, p. 94.

In the *Hay Fork Valley,* in Secs. 1, 3 and 33, T. 31 N., R. 11 W., M. D. M., a belt of limestone, exposed in places running northwest, is observed.

Bibl.: Bull. No. 38, p. 94.

A body of limestone, at the head of *Oregon Gulch,* in Sec. 3, T. 33 N., R. 10 W., M. D. M., was the source of lime in 1856, which was used in the construction of several buildings in Weaverville.

Bibl.: Bull. No. 38, p. 94.

MARBLE.

Outcrops of gray marble occur near the mouth of East Fork and near Taylor's Flat, in the Big Bar mining district; deposit has not been worked and its extent not determined.

Bibl.: Report XIII, p. 633.

MINERAL PAINT.

A body of red ocher has been used locally in Minersville, from the deposit owned by T. Bowerman, located in Sec. 15, T. 35 N., R. 8 W., M. D. M., on the east side of the east fork of Stewart's Fork. The ocher shows the blocky structure of the country rock, a highly weathered deposit of igneous origin.

Southern Pacific Railroad Company owns a deposit of similar material in Sec. 9, T. 35 N., R. 8 W., M. D. M.

Bibl.: Bull. No. 38, p. 342.

MINERAL WATER.

The Deer Lick Springs, formerly known as the Coombs, in Secs. 6 and 7, T. 30 N., R. 9 W., 9 miles southwest of Hay Fork, are the only springs in Trinity County to have the water on the market. Owners are the California Medicinal Springs Company, of New York; W. E. Joy, president. This company controls some 106 acres in all; there are 20 springs, one sulphur and the others iron. Water is bottled under the trade name of "Nipicuro" and is said to be good for all blood diseases. Only one spring has been developed, and the output at present is small. Reached by trail from Hay Fork. (Analysis follows.)

Bibl.: Report XIII, p. 523.

Another spring has been reported near Big Bar, in Sec. 3, T. 33 N., R. 12 W. It is owned by J. C. Pattison.

ANALYSIS OF "NIPICURO,"

A natural medicinal spring water from Deer Lick Springs, Trinity County, California.

	Parts per million	Grains per gallon
Total solids	8,560.00	496.48
Silica	24.82	1.44
Iron and aluminum (Fe and Al)	9.47	.55
Calcium (Ca)	1,521.53	83.25
Magnesium (Mg)	21.43	1.24
Sodium (Na)	1,332.05	77.26
Potassium (K)	163.17	9.14
Iodine (I)	5.19	.30
Sulphuric acid radical (SO_4)	1,504.17	87.24
Carbonic acid radical (CO_3)	53.62	3.11
Bi-carbonic acid radical (HCO_3)	436.03	25.29
Metaboric acid radical (BO_2)	Heavy trace	
Chlorine (Cl)	3,463.46	200.94
Oxygen to form Fe_2O_3	4.05	.23
	8,539.99	991.47
Hypothetical form of combination—		
Sodium chloride (NaCl)	3,388.04	196.51
Potassium iodide (KI)	6.79	.39
Potassium chloride (KCl)	308.26	17.88
Magnesium sulphate ($MgSO_4$)	101.33	6.05
Sodium metaborate ($NaBO_2$)		
Calcium chloride ($CaCl_2$)	1,972.64	114.41
Calcium sulphate ($CaSO_4$)	1,543.67	89.53
Calcium carbonate ($CaCO_3$)	89.36	5.18
Calcium bi-carbonate ($Ca(HCO_3)_2$)	753.94	43.90
Iron oxide and alumina (Fe_2O_3 and Al_2O_3)	13.52	.78
Silica (SiO_2)	24.82	1.44
Hydrogen sulphide gas	117.82	6.83

Reaction, strongly alkaline.

Analysis made by Professor Sanford C. Dinsmore, United States Government Agricultural Department, Nevada State University, Reno, Nevada.

ORNAMENTAL STONES.

A prominent belt of *jasper* occurs on the divide between the north fork of Trinity River and the east fork of the north fork, showing especially in Secs. 5 and 8, T. 35 N., R. 11 W., M. D. M.

Another belt is found on Red Mountain, at the head of Prospect Creek, in the southwest corner of T. 29 N., and in northwest corner of T. 28 N., R. 11 W., M. D. M.

Garnet is found in the vicinity of Carrville. Discovered in 1899 by G. L. Carr; richly colored ouvaroite (lime-chrome garnet) in small dodecahedral crystals from 1 to 3 millimeters in diameter, deep green in color, coating seams or cavities in chrome iron.

Bibl.: Bull. No. 37, pp. 39, 53.

PLATINUM.

Platinum is found in a number of placer mines in this county, but more especially in a belt from 10 to 15 miles wide from Junction City westward down the Trinity River; also a belt running in a southerly direction and covering the east side of Hay Fork. All the mines

in the South Fork section carry some platinum associated with gold. One clean-up near Junction City gave returns of 7 ounces of platinum to 240 ounces of gold, and occurs in well rounded grains. In the vicinity of Hay Fork it occurs as shot. Trinity at one time led in the production of platinum, but Butte County now ranks first on account of the recovery in the dredging operations.

Bibl.: Report X, p. 717; Bull. No. 38, pp. 346–49, 369; Bull. No. 36, p. 104.

QUICKSILVER.

Surface indications of quicksilver ores are found in several places throughout Trinity County, but active mining for this metal has only been pursued in the northeastern part of the county, between Crow Creek, a tributary to the east fork of the Trinity River, and the north fork of the east fork of the Trinity River. On the surface the country rock is serpentine, at times very much altered, probably being a product of igneous rocks. The material wherein the ore bodies form is a feldspar porphyry.

Bibl.: Reports VIII, p. 643; X, pp. 716–17; XII, pp. 371–72; Bull. No. 27, pp. 192, 193, 195; U. S. G. S., Monograph XIII, p. 366, 1888.

Altoona Quicksilver Mine, in Sec. 22, T. 38 N., R. 6 W., M. D. M., comprises the Trinity, Altoona and part of the Blockade mining claims, in the Shasta Forest Reserve, about 15 miles northeast of Carrville. It is owned by the Altoona Quicksilver Mining Company, of San Francisco. The holdings consist of several hundred acres of patented land; elevation, 4700 feet; acquired by this company in 1875, but prior to this time considerable quicksilver was extracted from surface workings. It was closed down from 1879 to 1894, on account of lawsuits. Some work done since 1894. There are four veins, three coming together at the lowest level, forming a mineralized zone 400 feet long, and from 4 to 50 feet wide; walls are quartz-porphyry; workings consist of a vertical shaft 450 feet deep, with 5 levels. In the lowest level, another shaft, 152 feet deep was sunk, from which 2 levels were driven. There are 7 levels in all, covering a territory of 1600 feet in a northwest and 1120 feet in a northeast direction, within which 4 different veins were worked to a depth of 600 feet. Mine makes considerable water, and was shut down in 1902, when fire destroyed part of the reduction plant, which has since been repaired. The reduction plant consists of a Knox & Osborne ore furnace. Several buildings on the property. It is the only quicksilver producer in the county, but only a few hundred dollars worth of this metal has been

the yearly output in recent years. Up to 1903 this mine produced 29,181 flasks. The old dump is now being worked. Water in the lower levels

Bibl.: Reports VIII, p. 643; X, p. 716; XII, p. 371; Bull. No. 27, p. 192; U. S. G. S., Monograph XIII, p. 366, 1888.

Carr, consisting of one claim, in Sec. 22, T. 38 N., R. 6 W., M. D. M., is only slightly developed by open cuts, exposing a little ore. It is owned by G. Carr, of Carrville.

Bibl.: Bull. No. 27, p. 193.

Integral, a small quicksilver producer a few years ago, is located in Secs. 14, 15, 21, 22, 23, 27 and 28, T. 38 N., R. 6 W., M. D. M., near Altoona, and in the Shasta Forest Reserve. It is owned by the Integral Mining Company, of San Francisco; E. W. McGraw, president. The holdings consist of 46 claims, and several sections of timber land. Ore occurs in lenses, but no large bodies exposed in the workings, which consist of a shaft 180 feet deep, 5 levels, a winze 120 feet deep, connecting the lower level with a tunnel 2760 feet long; also a few hundred feet of drifts; considerable amount of surface work has been done. Reduction equipment consists of a 24-ton Knox & Osborne furnace. Several buildings on the property. Only do assessment work.

Bibl.: Report, XII, p. 373; Bull. No. 27, pp. 193–194–195.

Trinity, consists of three claims, undeveloped, in Secs. 21 and 22, T. 36 N., R. 6 W., near the Carr prospect. Owned by Rieschling Brothers. Idle.

Bibl.: Bull. No. 27, p. 195.

SOAPSTONE.

Soapstone is found on Brown's Mountain, in Sec. 21, T. 33 N., R. 9 W., M. D. M., the croppings having a light gray color. It does not weather nor harden when exposed to the air. When put in the fire it does not disintegrate, and is used as fireproof material in fireplaces.

Bibl.: Bull. No. 38, pp. 353, 371.

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Report V	69.
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Report VII	189.
Report VIII	637, 643.
Report IX	262.
Report X	695, 727.
Report XI	480, 484.
Report XII	62, 63, 307, 314, 371, 372, 387.
Report XIII	56, 64, 437–368, 523, 560, 561, 603, 604, 623, 633, 644.

	Page
Bulletin No. 27	192, 193, 195.
Bulletin No. 36	102–104.
Bulletin No. 37	39, 53.
Bulletin No. 38	54, 94, 264, 272, 305, 306, 342, 346–349, 353, 360, 362, 363, 369, 370, 371, 375.
Bulletin No. 50	140–150.
Bulletin No. 52	53.
Bulletin No. 57	11.
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Year	Page
1902	239, 253.
1903	173, 175, 176.
1904	165, 166, 169–173, 177.
1905	115, 164, 165–169, 172, 182–184.
1906	178–185, 197.
1907 (Part 1)	120, 189–193, 196, 198, 199, 228, 229.
1908 (Part 1)	316–320, 324–326, 347, 353, 354.
1909 (Part 1)	261–265, 268, 269, 286, 287.
1910 (Part 1)	349–354, 358, 359, 379, 380.
1911 (Part 1)	465–470, 473–476, 501–503.
1912 (Part 1)	571, 572, 574–577, 584–586, 600, 602, 631, 632.

Topographical sheet, Shasta Quadrangle.

	Page
Bulletin No. 193	51–54.
Bulletin No. 196	9–24, 41–44, 52, 64, 1902.
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INDEX.

PAGE

Abram & Blythe placer mine (*see* Nash)
Accident mine ---- 33
Adams Exploration Co. ---- 145
Advance Consolidated mine ---- 33–34
Advance mine ---- 78, 81
Afterthought mine ---- 14, 15, 16–17, 62, 65
ore values at ---- 17
smelter of ---- 16
Ahlgren mine (*see* Russian Hill)
Alaska mine ---- 140
Alata Lime & Brick Company ---- 12
Alice mine ---- 34
Allgood & Castell ---- 116
Alta Bert Dredging Co. ---- 158, 174–175
Al Toland mine ---- 34
Altoona quicksilver mine ---- 179
American mine ---- 34
Amphibole asbestos ---- 8, 10
Amy Balch mine ---- 140
Anaconda asbestos deposit ---- 11
Analysis, of copper ores ---- 17, 18, 74
of electric pig-iron ---- 62
of manganese ore ---- 63
of "Nipicuro" water ---- 178
Ancient river channels ---- 68, 78, 80, 99, 106, 130
Anderson, Dr. Winslow ---- 64, 124
Anderson mine ---- 114
Antimony with copper ores ---- 14, 49
Antone quarry ---- 126
Armstrong mine ---- 140
Arps mine ---- 17
Arsenic with copper ore ---- 24
Asbestos, in Shasta County ---- 8–11
in Trinity County ---- 132–133
tests on ---- 10–11
Ascendry mine ---- 117
Assay values of copper ores ---- 17, 18, 74
of placer gold ---- 159, 161, 163, 165, 166, 167, 168, 169, 170, 171, 173
Atlantic mine ---- 35
Auriferous gravel, in Shasta County 32
gravel in Trinity County ---- 139
quartz veins in limestone ---- 78
veins, relation of, to peaks ---- 77
Australia mine ---- 35
Bag house at Mammoth mine ---- 24
Bailey mine ---- 82
Baines mine ---- 114
Baker Consolidated Copper Co. ---- 26
Baker mine ---- 82
Balaklala mine ---- 14, 17–18, 27
operating costs at ---- 18
ore values at ---- 18
Bald Eagle mine ---- 18
Point mine ---- 157
Banghart mine (*see* Mad Mule)
Bank of Tehama ---- 156
Banner Mining Co. ---- 101
Barite in copper ore ---- 17

PAGE

Bark House Creek mine ---- 100
Bartel Jacobs mine ---- 157
Bartolet mine ---- 171
Barton and Barham quarry ---- 123
and Lang mine ---- 126
Base ores in Shasta County ---- 7
Bates & Van Matre ---- 157
Bear Tooth mine ---- 134
Beaudry mine ---- 100, 157
Beaver Creek district ---- 70
mine ---- 115
Belgium-Bohemian Mining Co. ---- 90
Belle Josephine mine ---- 100
Bender mine ---- 82
Ben Neil mine ---- 82
Bennett Company ---- 100, 105, 112
Berry mine (*see* Evans)
Bibliography, on Shasta County ---- 65
on Siskiyou County ---- 128
on Trinity County ---- 182
Bigelow mine ---- 140
Big Bend hot springs ---- 64
Chief mine ---- 140
Creek mine ---- 157
East Fork mine ---- 158
Ledge mine ---- 81
Slide mine ---- 115
Black Bear mine ---- 35, 78, 82–83
Butte Mountain coal deposits ---- 73
Hawk mine ---- 35, 83
Lead mine (*see* Blue Gravel)
Palangus mine ---- 135
Prince mine (*see* Diamond)
Spider mine ---- 35
Tom mine ---- 51
Blackmore mine (*see* Trinity Gold Dredge)
Blake mine (*see* Whistle Bar)
Blind Lode mine ---- 83
Blister copper ---- 20
Bloomer mine ---- 100
Bloss & McClary ---- 158
Blue Bird mine (*see* Lost Channel)
Gravel mine ---- 100, 158
Hill mine ---- 101
Jacket mine ---- 140–141
Jay mine ---- 83, 141
Jeans mine (*see* Cub Bear)
Jib mine ---- 172
Lead mine ---- 84, 158
Ledge mine ---- 73–74
Bodie mine ---- 35
Bonanza King mine ---- 132
Bonanza mine ---- 36, 84, 141
Bower & Matlock mine ---- 158
Bowerman ocher deposit ---- 177
Bowersox mine ---- 101
Boyd mine ---- 172
Boyle mine ---- 84
Brazil mine ---- 115
Brick ---- 6, 12, 72, 73

PAGE

Bright Star mine 36
Brown & George mine 101
Bear mine 84, 130, 138, 141, 142
chrome deposits (*see* Little Castle Creek)
Brown's Bar mine 159
Mountain limestone 176
soapstone 180
Brunswick mine 29, 36
Brushy Canyon mine 19
Brusse gem stone deposit 125
Buckeye Bar mine 115
Buckeye mine 173
Buck mine 142
Building stone (*see* granite, sandstone, tuff, etc.)
Bully Choop mine 142
Bully Hill mine 14, 15, 19–20, 30, 62, 65
base ores of 19
copper oxides at 19
silver in 20
smelter of 20
zinc in 20
Bulwer & Virginia mine 36
Bumpass' Hell, boiling springs at 3
Bunker Hill mine 37
Burger mine 159
Burns, Wm., mine 114
Burton limestone deposit 121
Butte County, platinum in 179
Cacy mine 159
California Bar mine 117
and Detroit Mining Co. 54
Consolidated mine 84
-Oregon Power Co. 67, 72, 93, 120
Sandstone & Construction Co. 64
Californite 125
Callahan district 81
Calumet Consolidated mine 37
-Michigan Mining Co. 150
Campbell mine 101
Canal Gulch mine 115
Canyon Creek district 138
Cape Cod mine 85
Carboniferous rocks, in Shasta County 14
in Trinity County 176
Carnegie Group, Ltd. 37
Carrie mine 142
Carr mine 180
Casey mine (*see* Klein)
Castle Crag Soda Springs 124
Rock Springs 64
Cecilville mine 101
Cement & Mule Creek mine 159
Centennial mine 99
Central mine 37, 85
"Chalk" in Shasta County 61
Champion mine 85
Chance mine 20
Chapman and Fisher mine 159
and Voluntine mine 38
mine 142
Cherry Hill mine 85

PAGE

China Creek mine 101
Gulch mine (*see* Hicks)
Paul mine (*see* Johnson)
Sam mine 99
Chinese Company 111, 157, 162
Chloride mine (*see also* Globe) 138
Chrome, in Shasta County 6, 11
in Siskiyou County 11, 72
in Trinity County 133
Chromite (*see* chrome)
Chrysotile asbestos 8, 10, 133
Cinderella mine 135
Cinnabar (*see* Quicksilver)
Clara mine 38
Classic Hill mine 81, 102
Clay products, of Shasta County 12
of Siskiyou County 72
Clear Creek, dredging on 33
Cleveland mine 38, 143
Climatic conditions in Shasta County 7
Climax mine 38
Clipper mine (*see* Carnegie)
Clover mine 159
Coal, in Shasta County 12–13
in Siskiyou County 67, 73
in Trinity County 133–134
Coast Range system in Siskiyou County 67
Coffee Creek district 129, 138
Mining & Milling Co. 148
Colby mine (*see* Sturn)
Coleman & Hill brickyard (*see* Alata)
Colorado mine 38
Columbia mine 85
Commercial Copper & Gold Mining Co. 94
Compton mine 38
Condensed mine 86
Congress mine 20
Connor mine 86
Consolidated Gold Dredging Co. 39
Kascinaska mine 39
Siwash mine 117
Copley mine 20, 39
Copper, antimony with 14
arsenic with 24
barite with 17
blister 20
Button mine 135
City mill 30
City ores 15
geology of, in Shasta County 13–16
gold and silver with 14, 24, 26, 29
in Shasta County 13–29
in Siskiyou County 73–76
in Trinity County 131, 132, 134–138
lead with 14
matte 20, 24
Mountain Consolidated Mining Co. 28
nickel with 75
ore deposits in Shasta County 15
ores, assays of 17, 18, 74
Queen mine 74, 135
zinc with 14, 17, 21, 64, 65

PAGE

Corona de Oro mine 160
Corrine mine 39
Cortez mine 39
Costs, operating 17, 18, 40, 49, 102, 121, 144, 149, 162, 167, 168
various 17, 20, 49, 100, 102, 106, 118, 121, 134, 147, 172
Cottonwood district 80
Craig mine 143
Crapo mine 102
Crawley mine 86
Cretaceous rocks in Shasta County 14
Cronin mine 102
Crown Point mine 135
Crystal group (copper) 20
mine (gold) 40
Cub Bear and Blue Jeans mines 86
Cummings mine 86
Curley mine 160
Daggett mine 99, 100
Dakin Company 58
Dannenbrink Estate 160, 168
mine 160
Davis mine 74, 102, 103
Deadwood district 138
Deakin & Taylor mine (*see* old Spanish)
De Dallis mine 20
Dedrick district 130
Deep Channel mine 117
Deer Lick Springs 177, 178
De La Mar, J. R. 20
Delta Consolidated mine 40
Mining Company 6, 40
railroad 6
Denny-Bar Co. 90
Denny mine 102
Denver Mining Co. 97
Description of Siskiyou County streams 67–70
Desilhorst, William, scoop dredge 33
Dewey mine 72, 87
Devonian rocks, in Shasta County 14
in Trinity County 176
Diamond mine 40
Diatomaceous earth (*see* infusorial)
Dick Morris mine 104
Diller, J. S. 65, 181
Dixie Queen mine 143
Dog Creek district 31
Dolly Varden mine 160
Donkey mine 21, 65
zinc in 65
Doolittle mine 117
Double Eagle & Little Quartz mine 87
Douglas City mine 171
Dredges, gold, in Shasta County 30, 33, 39
in Siskiyou County 69, 104, 120
in Trinity County 130, 139, 175
platinum recovered by 179
Drinkwater mine 160
Driver mine 160
Dunnigan mine 104
East Fork district 130, 139
mine 161

PAGE

Eastlick mine 79, 103
Eastman mine 161
Edna B. mine 41
El Dorado & Eureka mines 29, 41
Electric power plants 8, 72, 132, 149
Electric smelting of iron ore 7, 61–62
Eliza mine 87
Elk Creek mine 87, 117
Elliott mine 104, 173
Ellston mine 104
Emigrant mine (*see* Truscott)
Empire Bar mine 117
Empire mine 41
Enright mine (*see* Old Spanish)
Enterprise mine 115, 139, 143–144
Esperanza mine 41
Espey mine 105
Eureka mine (*see also* El Dorado) 144
mine (copper) 135
Eureka Tellurium mine 42
Evans Bar mine 161
Evans mine 118
Eveleth's mine (*see* Brown Bear)
Evening Star mine 42
Everill mine 118
Excelsior mine 144
Fagundez mine (*see also* Humpback) 78
Fairview mine 144
Farrington limestone deposit 121, 123
Fioch Bros. quarry 127
Fire clay 12
First National Copper Company 17
First quartz location in Shasta County 60
Fir Tree mine 105
Five Pines mine 139, 146
rich pockets in 146
Flat Creek district 29
Fleetwood & Nannie S. mine 88
Florence mine 42
Ford & Foley mine 171
Forget-Me-Not mine 145
Forks of Salmon River mine 105–106
Fort Goff mine 106
Fortuna mine 135
Foster Gold Mining Co. 154
Fountain Head mine 145
Four Point mine 145
Franklin mine (*see also* Milkmaid) 42, 88
Freight rates to Trinity County 134
French Bar Placer mine 118
Gulch district 29, 31
mine (*see* American)
John mine (*see* Squaw Gulch)
Syndicate of Paris 102
Friday and Lowden group 21
Furnaces, electric, for smelting iron 62
Furnaceville copper district 13
Gambrinus mine 42
Garden Gulch mine 161
Gardner and Deming mine 106
Bros. mine (*see* Red Hill)
Garfield mine 43
Garret 178
Garvey brickyard 72

PAGE
Geeshan & Kellner mine 106
Gem mine 161
Gems (*see* Ornamental Stones)
Geological and topographical features of Siskiyou County 67
Geology, of copper deposits in Shasta County 13–16
of gold districts in Shasta County 31
of Siskiyou County 67, 76–81
of Trinity County 129, 130, 138
Giant Consolidated group 21
Gladstone mine 29, 31, 43–44
section of, ore shoots in 43
Glenn County Mining Co. 54
Globe mine 138, 145–147
Gold Ball mine 78
Belt mine 21
districts, of Shasta County 31
of Siskiyou County 77–81
of Trinity County 138–139
Dollar mine 162
dredging 30, 33, 69, 104, 120, 130, 139, 174–175
drift mines 116–120, 173
geology of 31, 67, 130, 138
gravels 32, 78, 80, 99, 129, 139
ground sluicing for 114–116, 172
Hill mine 89, 106
hydraulic mines 100–114, 157–172
in copper ores 14, 24, 26, 29
in Shasta County 29–60
in Siskiyou County 68, 69, 70–72, 76–121
in Trinity County 131–132, 138–175
Lead mine 118
placer mines 33, 99, 157–174
platinum with 125, 178
quartz mines 33–60, 81–98, 140–157
quartz ores, smelting of, with copper 29
Run mine 78
value of per ounce, from placers 159, 161, 163, 165, 166, 167, 168, 169, 170, 171, 173
Golden Ball mine (*see* California Consolidated)
Chest mine 147
Crown mine 44
Eagle mine 88
Jubilee mine 147–148
mine (*see* Brown Bear)
Nugget mine (*see* Elliott)
Seal mine 88
West mine 88
Golinsky group 22
Gordan mine 106
Gossan 15, 26, 27
Granite in Shasta County 60
in Siskiyou County 121
in Trinity County 131, 175
mine (copper) 135
Graton, L. C. 65
Gravel, auriferous 32, 78, 80, 99, 129, 139
Graves mine 173

PAGE
Gray Eagle mine (*see also* Sunny Hill) 45
Great Falls & Hope mines 44
Verde mine 22
Western Development Co. 16
Greenhorn district 114
Gulch mine (*see* Beaudry)
Green Mountain Tiger mine 79
Grey Eagle mine (copper) 73, 74, 81
Gribble mine (*see* Chapman & Fisher)
Grider mine 107
Griffin onyx quarries 125
Grizzly Gulch mine 89
Gumboat mine 89
Haas mine 162
Hackerman Bar mine (*see* Brown's Bar)
Hager & Haas mine 162
Halcyon mine 29, 45
Haley mine 107
Halstead mine (*see* Haley)
Hamilton brickyard 72
Hammer mine 89
Hang Bar mine 162
Hansen mine 89
Happy Camp district 81
copper mines in 73
Happy Home mine 107, 162
Hardscrabble mine 45, 78, 89, 107
Hardtack mine 148
Hard Times mine 148
Harrison Gulch district 31, 32
Hartford mine 22
Harvey mine 171
Haskins mine 162
Hatchet Creek mine (*see* Haskins)
Haunted Bar mine 173
Hawkins Bar mine 163
Hawkinsville district 114
Hay Fork Mining & Milling Co. 148
Valley coal field 133
limestone 176
Hazel Creek placers 33
Gold Mining Co. 43, 89
mine 81, 89
Headlight mine 148–149
Henderson mine 163
Heroult, electric smelting at 7, 61
Herr ranch, sandstone on 126
Hersey, O. H. 181
Hickey mine 108
Hicks mine 90
Hidden Treasure mine 173
"High grade" ore 66
Highland mine 45, 78, 90
History of mining in Shasta County 30
in Trinity County 130
Hi You mine 108
Hoboken mine 91
Hoffmann continuous kiln for burning lime 62
Holden chrome claims 11
Holt & Gregg, brickyard 12
lime kiln 63
quarry 62

PAGE

Homestake mine ---------- 78, 91
Hook & Ladder mine ---------- 163
Hooper Hill mine ---------- 108
Hoosier Hill mine ---------- 108
Hope mine (*see also* Great Falls) -- 46
Horseshoe and Homestake mine ---- 163
Horseshoe mine (*see* Layman)
Horsetown ---------- 30, 32
Hot springs (*see also* under Mineral Water) ---------- 8
Huertevant mine (*see* Valdor)
Huey Hill mine ---------- 108
Humboldt Gas & Electric Co. ------ 132
Placer Mining Co. ---------- 168
Humbug Creek district ---------- 70, 80
Hummer mine ---------- 74
Humpback mine ---------- 91
Hunter mine ---------- 149
Hurst & Eliason mine (*see* Steiner's Flat)
Hyampom Valley coal field ------- 133
Hydraulic Hill mine ---------- 163
Hydraulic mines (*see also* under Gold) ---------- 66
Hydroelectric plants ---------- 8, 72, 132
Igo district ---------- 31
Imperial Heights mine ---------- 108
Incorporated Company of New York of San Francisco ---------- 74 93
Incorporated Eastern Company ---- 93
Indian Bar mine ---------- 115
Creek & Panwocket mine ------ 163
Creek district ---------- 69
Creek Mining Co. ---------- 88
Creek Placer Mining Co. ------ 159
Inez mine ---------- 46
Infusorial earth ---------- 61
Ingersoll mine ---------- 22
Ingleside mine ---------- 164
Integral mine ---------- 180
Inyo mine ---------- 91
Iron Mountain copper district ------ 13
mine ---------- 15, 25
Iron ore, electric smelting of ---- 7, 61–62
in Shasta County ------- 6, 7, 61–62
in Siskiyou County ---------- 67, 121
in Trinity County ---------- 176
Ironsides mine ---------- 91
Isabel mine ---------- 149
Island Mountain Consolidated mine ---------- 136, 137
Jack Lowden mine ---------- 108
Jackson and Carter mine ---------- 137
mine (*see* Buckeye Bar)
Jacob mine ---------- 164
Jacoby mine ---------- 149–150
Jasper ---------- 178
Jerusalem mine ---------- 150
Jewel quarry ---------- 60
J. I. C. mine ---------- 46
Joe Ramus mine ---------- 109
John Miller mine ---------- 115
Johnson & China Paul mine ------- 79, 91
Joss mine ---------- 164
Jubilee mine ---------- 46

PAGE

Jumbo mine (*see* Ruby Basin)
Jumping Jack mine ---------- 22
Kangaroo mine ---------- 92
Katie May mine ---------- 92
King and Bayles mine (*see* King) mine (*see also* Golden West) -- 164
Solomon mine ---------- 92
Kit Carson mine ---------- 46
Klamath Hot Springs ---------- 125
Klamath River ---------- 66, 189
district ---------- 67–68
Gold Mining Co. ---------- 118
placer gold yield on ---------- 99
Klein mine ---------- 109
Knob Gulch placers ---------- 32
Kols wing dam mine ---------- 99
Kosh Creek mine ---------- 23
Laconia mine ---------- 46
La Grange hydraulic mine ------ 130, 164
Lapman mine ---------- 150
Larsen mine ---------- 165
Lassen Peak (*see* Mt. Lassen)
Last Chance mine ---------- 150
Mining Co. ---------- 162
Laurel mine ---------- 150
Layman mine ---------- 150
Lead ---------- 6
Lewiston district ---------- 130
Liberty district ---------- 114
mine ---------- 46
Lignite (*see* Coal)
Lime (*see also* Limestone) -------- 62
Limestone auriferous quartz veins in 78
Limestone in Shasta County ---- 6, 14, 62
in Siskiyou County ---------- 121–123
in Trinity County ---------- 176
Little Bonsa mine ---------- 92
Castle Creek chrome deposits -- 11
Joe mine ---------- 165
mine ---------- 75
Queen mine (*see* Morrison & Carlock)
Wonder mine (*see* Ironsides)
Lodi mine ---------- 47
Log Cabin Bar mine ---------- 165
Lone Pine mine ---------- 137
Long Gulch mine ---------- 165
Loraine mine ---------- 23
Lost Chord mine ---------- 47
Lou Daggett mine (*see* Siskiyou River Bend)
Lowden mine (*see also* Jack Lowden) ---------- 109
Lower Buckeye mine ---------- 165
Lower Dutton's Creek mine -------- 165
Luce quarry ---------- 123
Lucky Bob mine ---------- 118
Lucky Strike mine ---------- 92, 173
and Effie Belle mine ---------- 166
Macadam, in Shasta County ------- 63
in Siskiyou County ---------- 71, 123
MacParlane mine (*see* Woodbury)
Mad Mule mine ---------- 47
Ox mine ---------- 47

PAGE

Maduro mine ---------- 48
Malloy mine (*see* Oregonian)
Mammoth copper mine--------14, 23–25
bag house at ---------- 24
gold in ---------- 24
smelting practice at---------- 24
top-slicing stoping method in--- 23
Mammoth Mining Co.---------- 28
Manganese in Shasta County------ 63
Manzanita Bar mine---------- 99
Maple Creek mine---------- 166
Maple mine ---------- 150
Maplesden mine (*see* Happy Home)
wing dam mine---------- 99
Marble, in Shasta County---------- 63
in Siskiyou County---------123–124
in Trinity County---------- 177
Mountain ----------122, 123
Marrian and Goodale mine--------- 93
Marshall and Walters mine-------- 25
Martinez, smelter of Mountain copper Co. at---------- 26
Mason and Thayer mine (*see* Craig)
Bar and China Creek mine (*see* Larsen)
Masterson quarry ---------- 60
Matte, copper ----------20, 24
McAdams Creek district---------- 69
McAtee Bar mine---------- 166
McCall mine ---------- 48
McClaughrey group ---------- 93
McCloud River ----------6, 13
McClure mine ---------- 25
McConnell, Wm., claim---------- 99
McCreary mine (*see* Lowden)
McDaniels quarry ---------- 123
McGuffey mine ---------- 109
McKeen mine (*see* Cummings)
McKinney Creek mine---------- 116
McKinnon mine ---------- 48
McMahon mine ---------- 119
McMurray and Hupp mine-------- 171
McNeal mine (*see* Nordheimer)
Meckel mine ---------- 166
Michigan-Salmon mine --------109–110
Midas mine ----------30, 32, 48–49
Miles asbestos deposit---------- 11
Milich mine ---------- 110
Milkmaid and Franklin mines--29, 49–50
Miller, John, mine---------- 115
mine ----------119, 166
Mills, early, in Shasta County----- 30
Mineral Mountain mine---------- 25
Paint in Trinity County------- 177
Mineral production, of Shasta County 6
of Siskiyou County----------70–72
of Trinity County----------131–132
Mineral resources, of Shasta County 7
of Siskiyou County---------- 70
of Trinity County---------- 131
Mineral springs (*see* Mineral water)
Mineral water, in Shasta County---6, 64
in Siskiyou County---------124–125
in Trinity County----------177–178

PAGE

Minersville district ---------- 139
Mining conditions in Trinity County 130
Mining industries of Shasta County- 7
Minnesota mine ---------- 50
Modoc mine ---------- 151
Monarch mine ----------75, 93
Monk mine ---------- 166
Montezuma mine (*see also* Summit)
----------81, 119, 167
Morris mine ----------25, 172
Morrison and Carlock mine-------- 93
Gulch mine ---------- 166
Morton and Bliss mine---------- 50
Mott, M., mine---------- 99
Mountain Belle mine---------- 80
Boomer mine ---------- 151
Copper Co. ----------14, 25
mine ---------- 25
smelter of ---------- 26
Mines Syndicate Ltd.---------- 26
Monarch mine ---------- 26
Mount Lassen ----------3–6
Pleasant mine ---------- 50
Shasta ----------3, 66
Gold Mines Corporation----- 25
mine ---------- 50
Vernon mine ---------- 93
Mule Creek mine---------- 159
Murphy mine ---------- 137
Murray mine ---------- 51
Nash mine ---------- 167
Native Son mine---------- 110
Negunda mine ---------- 173
Nellie and Annie mine---------- 51
New River Placer mine---------- 167
York and Skylark mines------- 51
Niagara mine ---------- 51
Nickel in copper ore---------- 75
Nigger Boy mine---------- 93
Hill mine ---------- 167
Nightingale mine (*see* Siskiyou mine)
"Nipicuro" water, analysis of------ 178
Noble Electric Steel Co.----------61–62
Nonpariel mine ----------137, 151
Nordheimer mine ---------- 110
Northern California Dredge Co.----- 120
Power Co. ---------8, 17, 18, 26, 28, 31, 39, 44, 47, 49, 54, 56, 59, 62, 63
North Fork district---------- 130
Star mine ----------52, 151
Oak Bar district---------- 114
O'Connell mine ---------- 167
O'Donnell mine ---------- 116
Ohio group ---------- 94
mine ---------- 26
Old Diggings district---------- 29
Highland mine (*see* Highland)
Indian mine ---------- 94
Spanish mine ---------- 52
Vet and Eclipse mine---------- 94
Olive mine ---------- 52
Onley Creek ---------- 32
Ono district ---------- 31

PAGE
Operating costs ----------17, 18, 40, 49, 102, 121, 144, 149, 162, 167, 168
Oregon Consolidated mine---------- 26
Gulch ----------32, 176
Oregonian group ---------- 94
Oriole mine ---------- 152
Ornamental stones ----------125, 178
Oro Fino district---------- 79
mine ---------- 52
Grande mine ----------94, 152
Vista mine ---------- 52
Oswald mine (*see* Big East Fork)
Ouvaroite garnet ---------- 178
Overton mine ----------78, 94
Ozark mine ---------- 152
Pacific Coast Asbestos Co.---------- 11
Pacific Improvement Co.---------- 124
Paine mine ---------- 116
Paradise Flat mine---------- 119
Parker, H. L.---------- 8
quarry ---------- 124
Pattison spring ---------- 177
Peaks, relation of auriferous veins to 77
Pearl mine (*see* Ruby)
Peck mine (*see* Afterthought)
Peerless mine (*see* Ingersoll)
Phillips mine ---------- 75
Pierson & Co. mine---------- 99
Piety Hill mine (*see* Hardscrabble)
Pilot Knob mine---------- 95
Pine Grove mine----------100, 110
Pitt River ----------6, 13
floating mine timbers down---- 19
mine ---------- 26
Placer gold, assay value of---------- ----------159, 161, 163, 165, 166, 167, 168, 169, 170, 171, 173
Placer mines (*see* under Gold)
yield of, in Siskiyou County--- 99
Platinum in Siskiyou County---------- ----------67, 70, 71, 102, 125
in Trinity County---------131–132, 158, 159, 161, 163, 165, 167, 168, 169, 171, 173, 179–180
Plutus mine ---------- 75
Poison Camp coal field---------- 134
Polar Bear mine---------- 75
Polkingham mine ---------- 27
Popejoy mine ---------- 27
Portuguese Company ---------- 99
mine ---------- 111
Post and Wilson mine---------- 168
Potter and Humboldt mine--------- 168
Potilla mine ---------- 167
Potosi mine ---------- 52
Poverty Flat mine---------- 168
Power plants (*see* Electric)
Preckel mine (*see* Hooper Hill)
Preston Peak mine---------- 75
Prim and Dougherty chrome claims 11
Princess mine ---------- 53
Prospect Hill mine---------- 95
Providence mine ---------- 95
Pyrites ---------- 6

PAGE
Quartz Gulch mine---------- 111
Hill mine ----------39, 80, 95
mills in Shasta County--------- 30
Valley district ---------- 78
Quicksilver in Siskiyou County----- 126
in Trinity County--131–132, 179–180
Quimby mine ----------137, 152, 168
Quinn ranch, dredging on---------- 54
Railroad and Mt. Morensis mine--- 168
Rainbow mine ----------75, 173
Ralston mine ---------- 153
Ramis mine (*see* Dick Morris)
Ramus mine (*see* Joe Ramus; *also* Sylvester Ramus)
Ray mine ---------- 153
Raymond, R. W.---------- 65
Reading clay deposit---------- 12
Reading, origin of name---------- 30
Redding Brick & Tile Company---- 12
Major ---------- 130
Municipal quarry ---------- 63
Red Flat mine---------- 168
Hill mine ----------53, 95
(*see also* Michigan-Salmon; *also* Russian Hill; *also* Bartel Jacobs)
Point mine ---------- 171
Reeder group ---------- 96
Reid mine ---------- 53
Reindeer mine ---------- 153
Reynolds clay deposit---------- 73
Richman Company ---------- 93
Ridgeway mine ---------- 153
Riley and Bliss mine (*see* Morton & Bliss)
Robinson Gulch mine---------- 96
Rocky Bar mine (*see* Trinity Gold Dredge)
Roe mine ---------- 168
Roseman mine ---------- 27
Rothrop mine ---------- 76
Rough & Frye mine---------- 96
Ruby and Pearl mine---------- 53
Basin mine ---------- 96
Rush Creek quarry---------- 175
Russian Dump mine (*see* Russian Hill)
Hill mine ---------- 111
Rycroft mine ---------- 111
Sacramento and Eastern railroad--19, 61
River ----------6, 13, 34, 66
Saint Lawrence mine---------- 96
Salmon Mountain ---------- 77
Salmon River district---------- 77
Sam Hampton mine---------- 174
Houston mine ---------- 53
Sandstone, in Shasta County------- 64
in Siskiyou County---------- 127
Santana Brothers mine---------- 116
Sauer Kraut mine---------- 111
Scharber mine (*see* Gem)
Schloner mine ---------- 169
Schuler mine ---------- 119

PAGE

Scott Bar district 69, 79
Mountain 130
River district 68
Dredging Co. 102, 120
Mining Co. 85
Springs 124
Scottish Chief mine 53
"Seam diggings" 76, 81
Section, of Gladstone mine 43
of Headlight mine 150
of Uncle Sam mine 57
Seiad mine 112
Self-Shooter mine (*see* Ellston)
Senger mine 169
Shasta Copper Co. 63
Shasta County 3–65
antimony in 14, 19
asbestos in 6, 8–11
auriferous gravel in 32
bibliography on 65
brick in 6
chrome in 6, 11
clay products in 6, 12
climatic conditions in 7
coal in 12
copper in 6, 13–29
geology of 13–16
dredging in 30, 33, 39
early mills in 30
first quartz location in 60
geology of 13–16, 31
gold in 6, 29–60
districts in 29–32
dredging 30, 33, 39
geology of 31
granite in 60
gravel, auriferous in 32
hydroelectric plants in 8
infusorial earth in 61
iron ore in 6, 15, 61–62
lead in 6, 14
limestone in 6, 14, 62
macadam in 63
manganese in 63
marble in 63
mineral production of 6
resources of 7
springs in 64
water in 6, 64
mining industries of 7
pyrites in 6
sandstone in 64
silver in 6, 14
slate in 6
stone industry in 6
timber supply of 6, 14
transportation facilities in 6
tuff in 64
water resources of 6, 14
zinc in 14, 17, 19, 64–65
Shasta district 29
Dredging Co. 54
King mine 14, 27
May Blossom mine 28
Mining Co. 86
Monarch Mining Co. 42
Springs 124

PAGE

Sheffield mine (*see* Uncle Sam Consolidated)
Sheridan mine 169
Shiner mine 76
Shoo Fly mine (*see* Haskins)
Shur, Yunker & De Witt 87
Sierra Buttes Mining Co. 58
Nevadas in Siskiyou County 67
Sightman mine (*see* Cecilville)
Silver 6, 67, 70–72, 131–132
in copper ores 14
Falls mine 54
Grey mine 153
Simas and Rose mine 116
Siskiyou and Nightingale mines 54
Coal Mfg. Co. 73
Siskiyou County 66–128
bibliography on 128
brick in 72, 73
chrome in 67, 71, 72
clays in 72, 73
coal in 67, 72, 73
copper in 67, 71, 73–76
dredging in 69, 104, 120–121
electrical power plants in 72
gems in (*see also* Ornamental stones) 71, 72
geology of 67, 76–81
gold in 68, 69, 70–72, 76–121
districts 77–81
dredging 69, 104, 120–121
drift mines 116–120
geology of 76–81
ground sluicing 114–116
hydraulic mines 100–114
placer mines 99–100
quartz mines 81–98
granite in 121
gravel channels in 68, 78, 80, 99
iron in 121
lead in 67, 71
limestone in 71, 121–123
macadam in 71, 123
marble in 122, 123
mineral production of 70–72, 99
water in 67, 70–72, 124–125
ornamental stones in 125
platinum in 67, 70, 71, 102, 125
pumice in 71, 72
quicksilver in 126
rubble in 71
sandstone in 71, 126–127
silver in 67, 70–72
soapstone in 127–128
stone industry in 71, 72
streams in 67–70
table of placer production of 99
talc in 127
water resources of 67–70, 72
Siskiyou Dredging Co. 120–121
Klondike mine 112
Mineral Springs 125
Mines Company 112
Quicksilver Mining Co. 126
River Bend mine 112
Syndicate 86
Skelton mine 96

PAGE
Skylark mine (*see* New York)
Slate ---- 6
Creek mine ---- 169
Slattery & Welch mine---- 54
Slide Creek mine (*see* Beaudry)
Slide mine ---- 55
Slumway mine ---- 112
Smith mine ---- 154
Peter, clay deposit---- 73
Snider mine (*see* Carnegie)
Snow Gulch mine---- 174
Soapstone, in Siskiyou County--127–128
in Trinity County---- 180
Southern Pacific Railroad Co.---6, 66, 72
clay deposit of---- 12
limetsone deposits of---- 176
ocher deposit of---- 177
sandstone quarries of---- 127
South Fork district (*see* Igo)
mine (*see also* Silver Falls)--- 169
Sowden mine ---- 169
Specimen mine ---- 96
Spencer mine ---- 80
Spread Eagle mine---- 28
Squaw Creek district---- 32
Gulch mine ---- 113
Mining Co. ---- 87
Stark, J. M.---- 3
Star mine ---- 97
of the East mine---- 154
State Mining Bureau publications--
----65, 128, 181
Stauffer Chemical Co.---- 29
Steele quarry ---- 123
Steiner's Flat mine---- 170
Stella district ---- 31
Sterling mine ---- 97
Stevenson mine ---- 28
Stewart's Fork district---- 139
Stock & Stevens asbestos quarries--8–11
Stone industry, in Shasta County--- 6
in Siskiyou County----71, 72
in Trinity County---- 132
Stope map, of Gladstone mine---- 43
of Uncle Sam mine---- 57
Stowell mine ---- 28
Streams of Siskiyou County---67–70
Stribbling mine ---- 173
Sturdivant mine ---- 170
Sturn mine ---- 113
Suction dredges for gold---- 33
Sugar Hill mine---- 119
Loaf mine ---- 28
Sulphide mine ---- 29
Sulphur, at hot springs---- 3
Springs mine---- 116
Summit and Montezuma mines---- 55
group (copper) ---- 29
mine (*see* Sunny Hill)
Sunday Gulch mine---- 55
Sundown mine ---- 97
Sunny Hill mine---- 55
Supplanter mine ---- 154
Sybel mine (*see* Accident)
Sykes Mining Co.---- 158

PAGE
Sylvester Ramus mine---- 116
Table of mineral production, of
Shasta County ---- 6
of Siskiyou County---70–72, 99
of Trinity County----131–132
placer gold yield in Siskiyou
County ---- 99
Taft mine ---- 97
Talc (*see also* Soapstone)---- 127
Tanglefoot mine ---- 55
Taylor & Maplesden mine (*see* Deep
Channel)
Tebbe mine ---- 76
Teddy-Avalon mine ---- 97
Tellurides ---- 144
Ten Cent Gulch mine---- 170
Tener mine ---- 170
Ten Eyck mine---- 113
Texas Bar mine---- 170
Consolidated mine ---- 56
Spring quarry ---- 64
Thomain mine ---- 113
Thompson Creek quarry---- 124
Three Sisters mine---- 56
Timber supply, of Shasta County---6, 14
of Trinity County---- 130
Toland mine (*see* Al Toland)
Tolly Hill mine---- 170
Tom Green mine---- 56
Rogers mine ---- 116
Top Notch mine---- 171
Topographical features, of Siskiyou
County ---- 67
of Trinity County---- 129
Top-slicing stoping method---- 23
Toughnut mine ---- 154
Trail Creek mine---- 97
Transportation facilities ---6, 66, 130
Triangle mine ---- 154
Triassic rocks in Shasta County---- 14
Trinity Asbestos Mining Co.---- 133
Bonanza King mine----154–155
Center district ----129, 130, 139
Consolidated Hydraulic mine--- 171
Consolidated mine ---- 58
Copper Co. ---- 27
Trinity County ----129–181
asbestos in ----132–133
Bank ---- 153
bibliography on ---- 181
chromite in ---- 133
coal in ----133–134
copper in ----131–132, 134–138
dredging in ----130–139
electrical power plants in---- 132
gems in (*see* Ornamental stones)
geology of ----130, 138
gold in ----130, 131, 132, 138–175
dredging ----130, 139, 174–175
drift mines ----173–174
geology of ---- 138
ground sluicing mines----172–173
hydraulic mines ----157–172
mining districts ----138–139
placer mines ----157–175